MOTHERS' PERCEPTIONS OF THEIR CHILDREN'S INTELLECTUAL ABILITIES AND THEIR RELATIONSHIP TO ACADEMIC ACHIEVEMENT

By

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To my husband, John, for all his love and support.

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Major Department: Psychology

The purpose of this study was to determine (1) whether the accuracy of mothers' perceptions of their children's intellectual abilities could predict their children's academic achievement, (2) whether the demands made by mothers for their children's academic achievement varied as a function of their perceptions of their children's abilities, and (3) whether these demands could predict their children's academic achievement.

The participants were 70 elementary school children and their mothers. The mothers were asked to estimate their children's IQs and to indicate at what level of their children's academic achievement they would let them know they were pleased with their performance and at what level they would be dissatisfied. The children were administered a standardized IQ test (WISC-R) and data were gathered on

their school grades and Stanford Achievement Test scores. The accuracy of the mothers' perceptions was determined by taking the difference between the mothers' IQ estimates and the children's real IQs. These accuracy scores and the mothers' level of demands were then used in several multiple regression analyses to answer the main questions of the study. The following variables were included as controls: the children's age, sex, IQs, the mothers' education levels and the families' SES. It was predicted that the children with the most accurate mothers would have the highest level of academic achievement. It was also predicted that the mothers' demands would vary as a function of their perceptions of their children's abilities and that these demands in interaction with the children's IQs would predict the children's actual school performance.

The results were the following: (1) the mothers' perceptions were found to be relatively accurate but the accuracy did not predict their children's academic achievement; (2) a positive relationship was found between the mothers' demands and their beliefs about their children's abilities; (3) a positive relationship was found between the absolute level of the mothers' demands and their children's school performance. Since the study was correlational in nature, no causal interpretations could be made about the above relationships. It was concluded that the results supported the model of the cycle of influences between expectations and behaviors.

CHAPTER ONE
INTRODUCTION

Parents' and Teachers' Expectations: Antecedent and Effects

There are wide individual differences in academic achievement among children. Numerous studies have been conducted trying to determine what variables are responsible for these individual differences. Several variables have already been identified as good or moderate predictors of school achievement. Among them are certain demographic characteristics of students such as socio-economic status (SES), race, ethnic background, ordinal position, family size, etc. (Henderson, 1981). Performance on standardized tests of mental abilities or intelligence quotient (IQ) scores have also been well documented as good predictors of school achievement (Stanley & Hopkins, 1972). In addition, certain specific personality characteristics of students such as achievement need (as measured by projective tests or personality inventories), self concept, locus of control and others have also shown to be predictive of school performance (Naylor, 1972; Purkey, 1970).

Among the many variables that have been studied as possible predictors of school achievement is the expectancy variable. The effect that expectations have on achievement behavior has been studied from many different perspectives. Some researchers have focused on the expectations held by

teachers of their students' achievement behavior (Braun, 1976); others have focused on the expectations held by parents of their children's school performance (Callard, 1968; Entwisle & Hayduk, 1978; Mahan, 1975; Seginer, 1983); and still others have focused on the expectations held by the students of their own achievements (Entwisle & Hayduk, 1978; Rappaport & Rappaport, 1975; Stipek & Hoffman, 1980).

Perhaps one of the most publicized studies of the influence of expectations on intellectual behavior is Rosenthal and Jacobson's 1968 study. These investigators tried to determine whether manipulating the teachers' beliefs or expectations regarding the abilities of their students would produce changes in the children's intellectual behavior. The manipulation of the teachers' beliefs regarding the abilities of their students was done by giving the teachers a list of names of children who supposedly had been identified as potential academic "spurters." More specifically, the teachers were told that the children had been administered the "Harvard Test of Inflected Acquisition." This test, they were told, could identify those children who were likely to experience a spurt in academic and intellectual performance during the coming school year. In actuality, Rosenthal and Jacobson had administered Flanagan's Test of General Ability which is a standardized IQ test. This test was readministered again during the middle and at the end of the school year. In addition, Rosenthal and Jacobson gathered data on the children's general academic achievement

test scores, the children's school grades and the teachers' ratings of the children's behavior in the classroom. At the end of the school year, Rosenthal and Jacobson compared the intellectual performance of the children who had been labelled potential "spurters" to that of a control group of children. The results of the study showed that at the end of the school year greater intellectual gains were obtained by the experimental children than by the control children. The authors also reported that the teachers rated the behavior of the experimental children in more positive ways than that of the control children. Rosenthal and Jacobson concluded that the expectations held by the teachers with regards to the experimental children were probably responsible for the intellectual gains observed among these children.

Rosenthal and Jacobson's (1968) study was later criticized on many accounts and the "Pygmalion effect" they claimed to have demonstrated failed to replicate in numerous subsequent studies. Elashoff and Snow (1971) have reviewed in detail many of the design, sampling and measurement problems that plagued the original Rosenthal and Jacobson study. Among the many criticisms discussed in this review were the following: poor and ill-defined procedures for assigning the children to the experimental and control groups, substantial and differential subject attrition from the experimental and the control groups, the use of a standardized IQ test which had not been fully normed for use with younger children, the use of untrained teachers for the administration of the IQ test, lower than normal pre-test scores among

the younger children as well as extremely large pre- to post-test gains in IQ scores among these children. The most serious of the criticisms, however, was with regards to the validity of the experimental procedure itself. Rosenthal and Jacobson (1968) included a teacher interview and memory test at the end of their experiment. These procedures were included to validate the effects of the experimental manipulation technique used in the study, that is, to make sure the deception of the teachers had worked and their expectations of the experimental children had, in fact, been changed. The results of the interviews and the memory tests showed, according to Rosenthal and Jacobson (1968), that the teachers could not remember the names of the experimental children and that many of them had only casually looked at the lists of names given to them by the experimenters. Elashoff and Snow (1971) criticized the authors for failing to see the important implications of the teachers' reports and concluded: "Evidently the Pygmalion effect, if any, is an extremely subtle and elusive phenomenon that acts through teachers without conscious awareness on their part" (p. 42).

Numerous studies on teachers' expectations followed the initial Rosenthal and Jacobson's (1968) study. Some of these follow up studies were direct attempts at replicating the Pygmalion effect. Others were simply related studies attempting to further explore teacher expectancies. Baker and Crist (1971) reviewed several of these follow up studies, the majority of which failed to replicate Rosenthal and Jacobson's findings. According to these authors, the studies which were the

least likely to replicate their findings were those which followed Rosenthal and Jacobson's (1968) procedures more closely. They argued that the manipulation technique used by Rosenthal and Jacobson to increase the teachers' expectations of the experimental children was too weak to produce the type of effects expected. The authors also pointed out that significant effects of expectations were more likely to be found in studies that did not try to manipulate teachers' expectations but rather assessed the effects of the teachers' expectations which already existed naturally.

Dusek and O'Connell (1973) showed that naturally formed teacher expectancies are, in fact, more likely to affect students' achievement behavior than experimentally induced expectations. In their study, these authors asked the teachers of a group of second and fourth grade students to rank their students in terms of how well they thought they would perform at the end of the school year in language and arithmetic skills. The experimenters then randomly divided the students into a control and an experimental group. The teachers were given the names of the experimental children and were told that these children had been administered a test which had shown that they would show large improvements in language and arithmetic skills throughout the school year. In actuality, the children (both the experimental and the control group) had been administered the Stanford Achievement Test. This test was again administered at the middle and at the end of the school year. The results of

the study showed that the students who were initially ranked high by their teachers had higher SATs at all three administrations of the test than the children who were ranked lower. The results also showed that the experimental manipulation of teachers' expectations had no effect on the children's SAT scores. Most researchers today would agree that the formation of expectations is a complex phenomenon involving many variables and that experimentally induced expectations may not have the same kind of influence on achievement behavior as naturally formed expectations (Braun, 1976).

Despite all the problems with the Rosenthal and Jacobson (1968) study and the failure of the follow up studies to replicate their findings, research on expectancy effects has continued to date although it has taken many new and different directions. The theoretical background or the logical basis underlying research on expectancy effects is a sensible one and perhaps this is one reason why research in this area has continued (Braun, 1976). Expectations are believed to affect intellectual behavior in the following way: The expectations held by teachers or parents about a given child affect their own behavior towards that child. The behavior of the teacher or parent in turn affects the intellectual behavior of the child which then serves to confirm and reinforce the initial expectations of the teacher or parent. This sequence of influences creates a cycle which is self-perpetuating. In addition, the expectations of teachers and parents are believed to

affect the child's own self-expectations which also influence his intellectual or achievement behavior. Figure 1 illustrates this hypothesized cycle of influences between expectations and behavior. It should be noted that this illustration is a simplified version of the models presented by other authors (Braun, 1976; Seginer, 1983). Braun's (1976) model, for example, is more detailed but it is useful only to illustrate the effects of teachers' expectations of their students and not the effects of parents' expectations. Braun's model includes a number of variables that are likely to influence the natural formation of teachers' expectations of their students. Among the variables included are the following: the sex of the students, their IQ score, their physical appearance, their previous achievement scores, their cumulative folders, their ethnic background, the students' names, the teachers' knowledge of the students' siblings, the SES of the students' families, and the students' present achievement behaviors. In addition, Braun's model also includes a number of teachers' behaviors that are likely to vary as a function of the expectations they hold of their students. These behaviors are believed to influence the students' self-expectations and achievement behaviors. Among the teachers' behaviors listed are the following: quantity of interaction with the students, differential grouping of the students within the classroom, differential activities and questions provided for the students, and

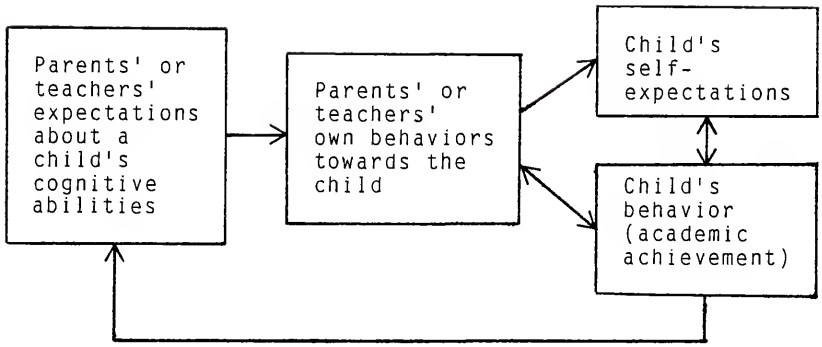

Figure 1. Hypothesized cycle of influences between expectations and behavior.

qualitative differences in the questioning of students (i.e., in prompting and waiting for the students' answers).

Seginer's (1983) model is also more detailed than the one presented in Figure 1. Her model, however, is only useful to illustrate the effects of parents' expectations of their children. Like Braun (1976), Seginer includes in her model some of the antecedent variables which may influence the formation of expectations except her variables apply to the expectations held by parents not teachers. Among the variables she considers influential she lists the parents' own educational aspirations, the feedback provided by the schools of their children's achievement behaviors, and a variable she terms "parental knowledge." This last variable refers to the general knowledge parents may have about the development of children, to their knowledge of the performance of children on intellectual tasks and to their assessments of their own children's development and performance. In her model, Seginer also includes some of the parental behaviors which may vary as a function of the expectations they hold of their children. In particular, she lists a category of behaviors she calls "achievement supporting behaviors" and another she calls "differential reinforcements."

Although there are many differences between Braun's (1976) and Seginer's (1983) models, the basic hypothesized sequence of influences between expectations and behaviors is the same in both models. It is this basic sequence of influences underlying both models that is illustrated in Figure 1. It is interesting to note that both Braun and

Seginer have expanded and provided details in their models in similar areas. More specifically, they have both tried to delineate some of the antecedent variables that may influence the natural formation of expectations and some of the specific behaviors which are influenced by these expectations. This is probably a reflection of some of the new directions that research on expectancy effects has taken since the initial Rosenthal and Jacobson (1968) study.

The search for variables that influence the natural formation of expectations has, in fact, been one of the areas where research on expectancy effects has been expanded. This research has been most productive with regards to teachers' expectations of their students and students' expectations of themselves. Braun (1976) has reviewed many of these studies and his model includes most of the variables that have been found to influence teachers' expectations of their students. Unfortunately the search for variables that affect the natural formation of parents' expectations of their children has not been as productive. Seginer (1983) has reviewed several studies of parental expectations. Her review shows that although there are some studies which have focused on these important antecedent variables, the bulk of the search remains to be done.

As mentioned before, Seginer (1983) delineated three important variables which may influence the formation of parental expectations: the parents' own educational aspirations, school feedback, and parental knowledge. She cites

studies in support of all three of these variables but this evidence is scarce. Among the more interesting studies she reviewed is one by Entwisle and Hayduk (1978) which shows, among other things, that school feedback may, in fact, influence parents' expectations of their children. In their study, Entwisle and Hayduk asked the parents of a group of children entering first grade to predict the school grades they thought their children would get. Their sample was drawn from two schools, one with predominantly middle class children and the other with mostly working class children. They followed the children's school performance longitudinally until the end of their second year in school. They also asked the parents to predict their children's grades three more times: towards the end of first grade, at the beginning of second grade, and again towards the end of second grade. In addition, the children themselves were asked to predict their own grades at the beginning and end of each school year. The results showed that the feedback parents received from the school about their children's grades appeared to have an influence on their future predictions of the grades their children would get. That is, parents apparently adjusted their expectations so that they were more in line with their children's actual school performance. Entwisle and Hayduk also reported that when these adjustments in expectations occurred they were more likely to be upward adjustments. That is, expectations were more likely to rise than to fall. They referred to this phenomenon as the "buoyancy effect." It should be mentioned that

Entwisle and Hayduk also found that the intial predictions parents made about their children's grades were very closely related to the children's actual IQ scores. This suggests that parental knowledge about their children also probably plays a role in the formation of their expectations. Again, this supports Seginer's (1983) model. More will be said about other results of the Entwisle and Hayduk study later in this chapter.

Seginer's (1983) suggestion that parental knowledge about children in general and their own children in particular may be an important variable influencing their expectations is an interesting one. Unfortunately, there is very little research on parental knowledge and beliefs about children. In a recent 1980 article McGillicuddy-de-Lisi has called for research on variables that may affect this type of parental knowledge. In this article, McGillicuddy-de-Lisi argues that parental belief systems may be an important variable affecting their parental practices towards their children. She emphasizes the importance of studying these belief systems and uncovering the variables that may have an influence in their formation. Among the variables she suggests for study are the following: the parents' amount of experience with children, the number of children they have, the sex distribution and spacing of the children, the parents' SES and others. These variables are supposedly important because according to McGillicuddy-de-Lisi parental beliefs about children undergo progressive changes whenever

parents encounter new and discrepant information and try to assimilate it into their current belief systems. The belief systems of parents who have more children or have children of different sexes are likely to be different from those of parents with only one child or children of only one sex. This is so because events such as the birth of a second child or a child of a different sex expose parents to new information about children and give them a chance to validate and modify their beliefs. McGillicuddy-de-Lisi (1980) reports some evidence that supports her claim that the above variables may have some influence on parental belief systems. More specifically, she reports having found that parental beliefs about how children come to understand certain concepts vary as a function of family configuration, SES, the sex of the parent and the sex of the child. Further research is needed to determine how parental beliefs are influenced by the above mentioned variables.

It is interesting to note that although McGillicuddy-de-Lisi does not use the word "expectations," the kind of relationship she proposes between parental belief systems and parental behaviors towards their children is very similar to that proposed for expectancy effects. McGillicuddy-de-Lisi (1980) conceptualizes the family as a "system of mutual influences." She argues that not only are parental beliefs and behaviors shaped by the variables she suggested above, they are also shaped by the children's reactions to the parents' beliefs and behaviors which in turn produce further changes in the parents' belief systems and behaviors.

Research is needed to determine how parental beliefs about children are formed and to determine what roles their beliefs play in the regulation of their parental practices.

Another popular area of expansion for research on expectancy effects has been the search for the different kinds of behaviors that are influenced by expectations. Initially, research on expectancy effects focused only on trying to determine whether teachers' expectations of their students had an effect on the students' achievement behaviors. Later, researchers began to focus their attention on how the teachers' expectations of their students affected the teachers' own behaviors towards those students. The teachers' behaviors towards their students and the students' own self-expectations were believed to be the two mediating processes by which expectations could affect the children's academic achievement. Therefore, researchers made an effort to delineate the specific teacher behaviors which may vary as a function of the expectations they hold of their students. Braun (1976) has reviewed many of these studies. The studies he has reviewed suggest that teachers do, in fact, treat and interact with their students differently depending on whether they believe the children to be high or low achievers. Behaviors such as the amount of praise they give to their students, the way in which they physically structure the classrooms and assign children into different learning groups, and all the other behaviors listed by Braun

(1976) in his model have been found to vary as a function of teachers' expectations.

Unfortunately, research on how parents' beliefs and expectations affect their own behavior towards their children is very scarce. Seginer (1983) suggested in her model that parents' achievement supporting behaviors may be one potential category of behaviors which may vary as a function of their expectations of their children. She also suggests that parents may use some kind of reinforcement procedures to make their children conform to their expectations, that is, differentially reinforcing achievement behaviors that are consistent with their expectations and ignoring or punishing those which are not. This is a very important area of research that deserves further study.

A study by Crandall, Dewey, Katkovsky and Preston (1964) explored the relationship between parents' attitudes about their children's achievement behaviors and their children's actual academic performances. They also examined how certain self-reported parental behaviors related to the children's actual academic performances. In this study, the experimenters interviewed the parents of a group of second, third and fourth grade children. In the interviews, the experimenters gathered data on the following variables: (1) the degree of importance or value the parents attached to their children's intellectual achievements, (2) the parents' beliefs about their children's level of intellectual competence, (3) the amount of dissatisfaction or satisfaction the parents felt about their children's intellectual

achievements, (4) the parents' minimal standards for their children's achievement performances, (5) the frequency and intensity with which the parents attempted to increase their children's participation and competence in intellectual activities, (6) the frequency and the extent of the parents' participation with their children in intellectual activities, (7) the frequency and intensity of the parents' positive reactions to their children's intellectual accomplishments, (8) the frequency and intensity of the parents' negative reactions to their children's lack of intellectual interests and accomplishments. These investigators also gathered data on other parental self-reported behaviors which were non-specific to the children's intellectual performances. In addition, the investigators administered the Stanford-Binet Intelligence Test to the children and gathered data on the children's performances on the California Achievement Test. The results of this study showed that only a few of the parents' attitudes and self-reported behaviors were related to the children's actual academic performances. Also, many of the relationships found were specific only to the mothers' attitudes and behaviors but not the fathers'. For example, the mothers' beliefs about their children's level of intellectual competence and their degree of expressed satisfaction/dissatisfaction with their children's performances were found to be positively related to the children's actual academic achievements. These relationships, however, were not significant for the fathers'

beliefs. Another interesting finding was that only the fathers' reactions (positive or negative) to their daughters' achievements were found to be related to their daughters' actual school performance. Finally, the parents' frequency of participation with their children in intellectual activities and the degree to which they attempted to increase their children's involvement in these activities related negatively to the children's actual school performance. It should be pointed out that the children sampled for this study were well above average in intellectual performance. The average IQ for the sample was 124 with a standard deviation of 16 and approximately 40% of the sample had IQs above 130! Thus, it should be kept in mind that the results reported by Crandall et al. (1964) may not generalize to other samples of children with more normal levels of intellectual abilities. Despite this problem, however, this study is an interesting attempt at trying to determine what kind of parental attitudes and behaviors may affect children's academic achievement. It is also unfortunate that these investigators did not try to determine whether the parents' self-reported behaviors varied as a function of their beliefs about their children's level of intellectual competence. This is exactly the type of question that Seginer and McGillicuddy-de-Lisi would like to see answered.

The Accuracy of Parents' Perceptions of Their Children's Intellectual Abilities

The accuracy of parents' perceptions of their children's intellectual abilities is an important variable

which unfortunately has been mostly ignored in research studies on expectancy effects. These studies usually have been done with the underlying assumption that expectancy effects on achievement behavior can be produced by simply increasing expectations. The level of ability of the child is usually not taken into account. That is, it is usually assumed that higher expectations will produce higher academic achievement regardless of the level of ability of the child. Mahan (1975), for example, attempted to raise student achievement behavior by manipulating parental expectations. Her sample consisted of a group of low SES elementary school children who had scored in the bottom two-thirds of the Stanford Achievement Test. The parents of the experimental children were contacted by their children's teachers who had been instructed to tell the parents that their children were capable of doing better in school. The teachers also met with the parents of the control children but did not attempt to raise parental expectations among them. The results of the study showed that the scores of the Stanford Achievement Test at the end of the school year were no different for the experimental children than for the control children. The study did not clearly show whether the parents' expectations of the experimental children had been successfully manipulated although the author did report that more of the experimental parents reported being dissatisfied with their children's school work after talking to their children's teachers.

Mahan's study had many serious flaws most of which were addressed by the author in discussing her results. However, one of the main problems with the study which was not addressed was the fact that it did not take the students' level of ability into account. The author simply assumed, as is often done in research on expectancy effects, that expectations could affect achievement behavior regardless of the level of ability of the children involved. This assumption needs to be examined in future research.

Hunt and Paraskevopoulos (1980) have recently argued that the accuracy of parents' perceptions about their children's intellectual abilities may play an important role in their children's cognitive development and actual intellectual performance. These authors start out with the premise that children benefit most from cognitive experiences which are moderately discrepant from their current level of cognitive development. They then argue that trying to achieve this moderate level of discrepancy when presenting a task to a child requires accurate perception of the child's current level of cognitive development. They refer to this as the problem of the "match." According to Hunt and Paraskevopoulos, parents with accurate perceptions of their children's level of cognitive abilities should be able to produce better "matching" experiences for their children. Thus, this should lead to better cognitive development among children with accurate parents.

Hunt and Paraskevopoulos (1980) attempted to find evidence in support of their hypothesis. In their study they

asked a group of 50 mothers to predict how their children (3-9 to 5-4 years of age) would respond to a set of 96 test items taken from three different standardized tests. They also administered these same test items to the children to determine the accuracy of the mothers' perceptions. The authors expected to find a negative correlation between the inaccuracy of the mothers' predictions and the children's level of cognitive development. The results of the study supported their hypothesis. A correlation of $r = -.80$ was found between the number of incorrect predictions given by the mothers and the number of test items passed by the children. A closer examination of the results, however, showed that this correlation could have resulted from a methodological artifact. Apparently, the accuracy of mothers' predictions was correlated to the children's level of cognitive performance because the more items of the test the children passed, the fewer overestimations or false predictions their mothers could make. This possible methodological artifact made the results of Hunt and Paraskevopoulos' study inconclusive. Further research is needed to test their hypothesis and to determine whether in fact mothers' accuracy of perception of their children's cognitive abilities is predictive of their children's level of cognitive development.

Entwisle and Hayduk's (1978) study, which was described earlier, also found some evidence which is congruent with Hunt and Paraskevopoulos' claims. In their study, they found that there was a racial difference in the level of parents'

initial expectations of their children's first grades in school. White parents' initial expectations tended to be very conservative (averaging slightly under a "B" grade) and were highly correlated with their children's actual IQ scores. Black parents' expectations were found to be unrealistically high and failed to correlate with their children's IQ scores. The authors reported that when the parents' expectations were too discrepant from the children's actual level of performance they failed to show any effect on future grades. However, a slight discrepancy between the parents' expectations and their children's grades tended to predict a change in the children's future grades. Whenever the children's grades showed change they tended to change towards achieving greater consistency with the parents' expectations. Interestingly, the children's own expectations were also found to be very high and unrealistic regardless of the children's race. Entwisle and Hayduk's results emphasize the need to take children's level of ability into account when assessing the effects of expectations on children's achievement behavior. Their results also point to the fact that parental accuracy in perceiving their children's abilities may play an important role in the formation of parents' expectations and in the effects these expectations have on their children's achievements.

Goal of Thesis

There are several issues on expectancy effects that seem to deserve further study. One of these issues is the role that children's level of intellectual abilities may

play in determining the effects that expectations have on their academic achievement. Research on expectancy effects has been characterized by a failure to take this important variable into account when assessing the effects of expectations on academic achievement. Dusek and O'Connell (1973), for example, tried to determine whether naturally formed teachers' expectations had different effects on children's academic achievement than experimentally induced expectations. They found that naturally formed expectations predicted the children's level of achievement while experimentally induced expectations did not. These investigators, however, failed to control for differences in the children's level of ability when assessing the effects of the two types of expectations on the children's academic achievement. It is possible that the reason why the teachers' naturally formed expectations related to the children's achievement measure was that these expectations may have been based on their assessments of the children's actual intellectual abilities. These assessments were probably fairly accurate and thus related to the children's actual achievement performance.

Another way in which researchers have neglected to consider children's intellectual abilities as an important variable influencing expectancy effects is by assuming that children's academic achievement can be improved by simply raising parents' and/or teachers' expectations of these children (Mahan, 1975). Entwisle and Hayduk's (1978)

research, however, has indicated that the absolute level of expectations may not be as important in predicting changes in children's academic achievement as the fit or the degree of discrepancy between these expectations and the children's actual academic performance. They have also shown that when expectations are unrealistically high they fail to have any effect on children's academic achievement. It seems that if expectations are to have any effect on achievement behavior they must be based on relatively accurate assessments of children's abilities. This issue of accuracy in the perception of children's intellectual abilities is an important one because the accuracy of perception helps determine the degree to which the expectations held by teachers or parents will be realistic given the level of ability of the children.

Hunt and Paraskevopoulos (1980) have also suggested the important role that the accuracy of parents' perceptions of their children's intellectual abilities may be playing in their children's overall level of cognitive development. Although the results of their study were inconclusive due to a methodological artifact, their hypothesis is an interesting one which needs to be re-examined.

The goal of the present study was to determine whether a specific aspect of parental beliefs about their children's abilities, namely, the accuracy of their perceptions, predicted their children's academic achievement. The study also examined some of the variables that may affect the accuracy of parents' perceptions of their children's abilities. This study differed from others in that it included

important controls of variables which are known to affect children's academic achievement and which other studies have typically ignored. It also differed in the way in which mothers' perceptions of their children's intellectual abilities were assessed. Hunt and Paraskevopoulos (1980), for example, asked mothers to predict how their children would respond to a set of specific test questions. In the present study the mothers' perceptions of their children's abilities were assessed in a more global manner. A group of mothers of elementary school children were asked to rate their children's overall level of intellectual abilities and to give estimates of their children's IQ scores. It seems reasonable to assume that most parents have an overall impression of their children's level of ability. It is the accuracy of this overall impression that this study attempted to assess. The accuracy of the mothers' perceptions of their children's abilities was determined by computing a deviation score which indicated how far or how close the mothers' estimates of their children's IQ scores were to the children's real IQs. These accuracy scores were then used in several analyses to try to answer a number of questions about the variables that may influence the accuracy of mothers' perceptions and to answer the question of whether the accuracy of mothers' perceptions could predict the children's academic achievement. All of the analyses performed included the following variables as controls: the age of

the children, their sex, their IQ scores, the mothers' level of education and the families' SES.

The more specific questions asked and the predictions made were the following:

1. Does the accuracy of the mothers' perceptions of their children's abilities vary as a function of the following variables: the children's age, sex, IQ scores, the mothers' level of education and the families' SES? It was expected that the accuracy of the mothers' perceptions would vary as a function of the mothers' level of education and the families' SES. That is, mothers with more years of formal schooling were expected to be more accurate than mothers with fewer years of formal schooling. Likewise, the mothers of children from higher SES families were expected to be more accurate than those from lower SES families. In addition, the mothers' accuracy was expected to vary as a function of the children's ages. It was expected that mothers with older children would be more accurate than mothers with younger children. The rationale behind this prediction was that the mothers of the older children have had a chance to receive more feedback from the schools about their children's intellectual performance than the mothers with younger children. These mothers have also had more chances to observe their children and to adjust their overall impressions of their children's abilities. Therefore, they should be more accurate than the mothers of younger children.

2. Does the accuracy of mothers' perceptions predict the children's level of academic achievement? Data were gathered on the children's grades in school and their Stanford Achievement Test scores. These measures were then used to determine whether academic achievement varied as a function of the mothers' accuracy scores. It was expected that the children with relatively accurate mothers would have the highest level of academic achievement. The children with inaccurate mothers (both those who overestimated and those who underestimated their children's abilities) were expected to have lower levels of academic achievement.

3. Is there a relationship between the accuracy of mothers' perceptions of their children's intellectual abilities and the frequency of opportunities mothers have to observe and compare their children's intellectual abilities? The mothers were asked to report how frequently they had the opportunity to observe their children's intellectual abilities under a variety of circumstances. They were also asked to report how frequently they had the opportunity to compare their children's abilities to those of other children of their child's age. A relationship was expected between the mothers' reports of the frequency of opportunities they have to observe and compare their children and their accuracy scores. More specifically, mothers who reported having more frequent opportunities to observe and compare their children's abilities were expected to be

more accurate than those who reported having less frequent opportunities.

Another aspect of expectancy effects research that seems to deserve further study is the relationship between parents' beliefs about their children's abilities and their own behavior towards their children. Previous research has shown that the behavior of teachers towards their students varies as a function of the teachers' expectations of those students (Braun, 1976). There is, however, very little research on how parents' behaviors towards their children vary as a function of the parents' beliefs about their children. The second goal of the present study was to examine a specific type of parental behavior, namely the demands mothers make for their children's academic achievment, and to determine whether they vary as a function of the mothers' beliefs about their children's abilities. It should be pointed out that in the present study there was no direct measure of the mothers' behaviors or the demands they made of their children. Instead, a self-report measure was used in which the mothers were asked to indicate the level of academic achievement at which they would let their children know that they were very pleased with their school work and the level at which they would let them know they were dissatisfied. This measure was similar to the Crandall et al. (1964) measure of mothers' minimal standards of academic achievement which was found to be related to their daughters' actual academic achievement. The following specific questions were asked in

this study about the mothers' self-reported demands for their children's academic achievement:

1. Do the mothers' demands vary as a function of their perceptions of their children's intellectual abilities and the following variables: the children's age, sex, IQ scores, the mothers' level of education and the families' SES? Mothers who perceived their children as having higher levels of intellectual ability were expected to make higher demands of their children than mothers who perceived their children as having lower levels of intellectual ability. Also, the mothers of older children, children with higher IQs, and children from higher SES families were expected to make higher demands than the mothers of younger children, children with lower IQs and children from lower SES families. Finally, the more educated mothers were also expected to make higher demands of their children than the mothers with lower education levels.

2. Is there an interaction effect of the mothers' level of demands and the children's IQ scores which serves to predict the children's level of academic achievement? Higher demands for academic achievement were expected to predict higher levels of actual academic achievement only for children with certain levels of IQ. The rationale behind this prediction is that the appropriateness of mothers' demands, given their children's actual level of ability, may be more important than the absolute level of the demands.

CHAPTER TWO
METHOD

Subjects

The participants of this study consisted of 70 children and their mothers. The subjects were recruited through the cooperation of three elementary schools in the Jacksonville, Florida, area: San Jose Catholic School, The Chappell School and Southside Estates Academy. Permission to conduct the research at these schools was obtained by contacting the principals of 15 private schools in the area. Only private institutions were contacted because the Duval County School Board had already denied permission to conduct the research at any of their public schools. The above three schools were the only private schools interested in participating in the study.

The schools from which the sample was drawn were comparable in many respects. The student enrollment at all three of these schools is relatively small: San Jose Catholic has approximately 250 children enrolled in grades 1st through 6th; The Chappell School has 185; and Southside Estates Academy has 183. The slightly larger number of students at the Catholic school is due to the fact that this school has two sections of 5th and 6th graders. The average class size, however, is about the same in all three schools, that is, approximately 30 students per class. The schools

are also similar with respect to their tuition charges which range from 135 to 150 dollars per month. Also, none of these schools has any special selection criteria for the admission of its students. The academic curriculum of these schools is very similar to that of most public schools except for the addition of some specialized classes to the private schools' curriculums. San Jose Catholic School, for example, includes a Catholic catechism class in addition to their basic academic curriculum; The Chappell School includes a Spanish course; and Southside Estates Academy includes a Bible class.

In order to recruit the subjects, 618 letters were sent to the mothers of all the children of elementary school age attending the above schools (grades 1st through 6th). The recruitment letter explained the purpose of the research study and asked the mothers to volunteer as participants. The letter also let them know that their participation would consist of a 45-minute session in which they would be asked to answer a questionnaire about their children's intellectual abilities and school work. In addition, this letter asked the mothers for their permission to test their children and to have access to their children's school records. A copy of the recruitment letter sent to the mothers is included in Appendix A.

The overall response rate to the recruitment letter was approximately 12%. Among the mothers who responded, five had to be excluded from the study due to the fact that they already knew their children's intelligence quotient scores

(IQ scores) from previous administrations of intelligence tests to their children. In addition, 15 of the mothers who responded had more than one child in the age range required for participation in the study. In these cases, only one of the children was included in the study. The choice of which child to include was made at random by the experimenter. Seventeen children were excluded from the study for this reason. The final participation rate by school was approximately 14% (34 children) from San Jose Catholic, 11% (20 children) from The Chappell School, and 9% (16 children) from Southside Estates Academy.

The children who participated in the study ranged in age from 6 years 3 months to 12 years 6 months. The average age was 9 years 5 months and the standard deviation was 1 year 10 months. Approximately half of the children were males (34) and half were females (36). Most of them were white (90%) with the exception of three black and four oriental children. In addition, five of the white children were Spanish surnamed.

The majority of the children came from families in the middle to upper-middle socio-economic status (SES) as indi cated by their fathers' occupations and level of education. Approximately 74% of the sample had fathers with educations beyond the high school level and at least 80% of the children's fathers were engaged in white collar and/or professional occupations. Since SES is one of the variables of interest in this study, more will be said about the families' SES levels later in the Results chapter. It should be noted that two children in the sample came from homes where

there was no father present. In one of these cases it was due to the father's death and in the other it was due to divorce. The majority of the children, however, came from intact families (77%) and 19% came from families in which the parents had been divorced but the mother was remarried.

Most of the mothers who participated in the study had educations beyond the high school level and only one mother had failed to complete high school. The number of years of formal schooling for the total sample of mothers ranged from 9 to 20 years with a mean of 13.87 years and a standard deviation of 1.81 years. More will be said about the mothers' education in the Results chapter.

The majority of the mothers interviewed for the study had occupations outside their homes or were fulltime college students (77%). The remainder were homemakers. For the most part, the mothers who worked outside their homes were engaged in white collar traditional female occupations such as teaching or clerical and secretarial positions.

Procedure

The mothers who responded to the recruitment letter were contacted by phone and an appointment was made to meet with them at a time of their convenience. All the mothers were seen individually at their own homes by a 26-year old female investigator. The meetings lasted approximately 30 to 45 minutes. At these meetings the mothers were asked to complete a questionnaire about their children's intellectual abilities and school work. A copy of this questionnaire is included in Appendix B.

Before giving the mothers the questionnaire the experimenter explained the purpose of the research and reminded them of what would be required of them and their children as participants of the study. At this point the mothers were asked to read and sign a human subjects informed consent form. A copy of this consent form is included in Appendix C. The initial explanations given by the experimenter were usually brief since the same explanations were restated in the consent form in lengthier form. After the subject had read and signed this consent form and all her questions had been answered, the experimenter introduced the questionnaire by saying the following: "This is the questionnaire that I would like you to fill out. I would like you to fill it out with (child's name) in mind. Since we are interested in finding out what you think about your child's abilities, there are no right or wrong answers to these questions. It is very important, however, that you try to be as honest as you can when answering these questions so that we know exactly how you feel about your child's intellectual abilities. Please feel free to ask any questions you may have while filling out the questionnaire."

After the mothers had completed the questionnaire the experimenter checked it to make sure no questions had been left unanswered. The mothers were then told the date and time at which their children would be tested. The mothers were also asked to send a note to their child's teacher on the day the child would be tested to let the teacher know the time at which the child would be taken out of class. In

addition, the mothers were asked to remind their children on the date of their test that they would be taken out of class for about an hour to be tested. They were also instructed to tell the children that the test was not a "school" test and that the results of the test would not affect their grades in any way. Since the experimenter who administered the questionnaire to the mothers was the same who tested all the children, the experimenter had a chance to meet the children at their own homes before the date of their test. The experimenter tried to establish rapport with the children at the time of this first meeting and also reassured the children that the test would not be hard. If the children asked why they had to take this test, they were told that the experimenter had to test 70 children to be able to graduate from college and that they were doing this as a favor to the experimenter.

The test administered to the children was the Wechsler Intelligence Scale for Children-Revised (WISC-R). All the children were tested individually at offices provided by their schools. The administration of the test lasted approximately 45 minutes to an hour depending on the child. At the beginning of the test the children were told to try to do their best but not to worry if they could not answer all the questions because some of the questions were made for older children. They were also reminded that the results of the test would not affect their school grades and that neither their teachers nor their mothers would be given the results.

Variables

The following is a list of the variables used in the study:

1. Age of the children. This variable was used as a continuous variable. A large age range of children was sampled in order to insure reasonable variability in the data. This was important because the analysis of the data was correlational in nature. As mentioned before, the children ranged in age from 6-3 to 12-6 years (mean = 9-5, s.d. = 1-10).

2. Sex of the children. Approximately equal numbers of male and female children were sampled for the study. This variable was the only categorical variable included in the analysis of the data and was used mainly as a control variable.

3. Socio-economic status (SES) of the children's families. This variable was quantified by using Hollingshead's Two Factor Index of Social Position (Bonjean, Hill & McLemore, 1967). This measure utilizes the fathers' occupations and education levels to arrive at a numerical SES score. The procedure followed to derive the SES numerical scores was the following: First, the fathers' occupations and education levels were rated on two separate 7-point rating scales designed by Hollingshead (Bonjean et al., 1967). The seven positions of these occupational and educational scales are listed in Tables 3 and 4 in the Results chapter. The scale scores assigned were then used in the following formula to compute the numerical SES score or the "index of

social position score" (Bonjean et al., 1967, p. 385): occupational scale score x 7 (factor weight) = partial score; education scale score x 4 (factor weight) = partial score. The index of social position score is the sum of the two partial scores.

The possible SES scores that can be obtained by using this index range from 11 to 77. It should be noted that a low index score on this measure indicates a high social status position and a high index score indicates a low social status position.

4. Mothers' level of education. This variable was used as a continuous variable. It was recorded in terms of the number of years of formal schooling the mothers had achieved.

5. Children's Intelligence Quotients (IQs). The children's scores on the Wechsler Intelligence Scale for Children-Revised were also used as a variable in the study. Only the full scale IQ scores (combined verbal and performance IQ scores) of the scale were used.

6. Children's Academic Achievement. Two parallel measures of the children's academic achievement were used:

a. The children's national percentile scores on the 1983 administration of the Stanford Achievement Test (SAT).

b. The children's overall grade point averages (GPAs) for the academic year 1982-1983. An overall grade point average score was computed for each child by using the following scale: A = 4.0 points; A- = 3.75

points; B+ = 3.25 points; B = 3.0 points; B- = 2.75 points; C+ = 2.25 points; C = 2.0 points; C- = 1.75 points; D+ = 1.25 points; D = 1.0 points; D- = 0.5 points; F = 0 points.

In computing these GPA scores only the grades received in the following courses were used: Reading, Mathematics, English, Spelling, Science & Health, and Social Studies. The children's grades on courses such as Physical Education, Music, Art, Spanish or Religious Education were excluded when computing the GPA scores. This was done because many of these courses were not assigned letter grades. Also, some of these courses were not taught at all three schools. It should be noted that the grading scales of the three schools from which the children were sampled differed slightly. The following grading scales were printed on the report cards of each of the three schools:

San Jose Catholic

A = 93-100
B = 87-92
C = 76-86
D = 66-75
F = 65 and below

The Chappell School

A = 95-100
B = 85-94
C = 75-84
D = 70-74
F = 69 and below

Southside Estates Academy

A = Superior
B = Above Average
C = Average
D = Below Average
F = Failure

No attempt was made to adjust the children's grades to one comparable scale. This would have been an impossible task since one of the schools did not even provide numerical equivalents for the letter grades they assigned.

In addition to the above variables, a number of measures were derived from the questionnaire administered to the mothers. The measures that follow were all derived from this questionnaire.

7. Mothers' perceptions of their children's intellectual abilities. Three parallel measures of the mothers' perceptions of their children's abilities were derived from questions number 5, 7, and 8 of the questionnaire. These questions asked the mothers to estimate their children's intellectual abilities in three different ways:

a. Question #5 asked for a rating of their children's intellectual abilities.

b. Question #7 asked for a numerical estimate of their children's IQ scores and a lower and upper bound number of an interval within which they thought their children's IQ scores would fall.

c. Question #8 asked for a percentile estimate of their children's IQ scores.

Question #5 of the questionnaire provided a 9-point rating scale for the mothers to rate their children's intellectual abilities. This rating scale had the following scale positions:

1. exceptional--he is an extremely bright child, gifted for his age.

2. well above average--he is a very bright child, brighter than most children his age.

3. above average--he is slightly brighter than the average child his age.

4. slightly above average--he is slightly brighter than the average child his age.

5. average--he is as capable as the average child of his age.

6. slightly below average--he is slightly less capable than the average child of his age.

7. below average--he is less capable than the average child his age.

8. well below average--he has difficulty keeping up with most children of his age.

9. extremely below average--he is not capable of keeping up with children of his age.

After the mothers had rated their children's intellectual abilities on the above scale and before they were asked to give a numerical estimate of their children's IQ scores, they were provided with the following information in question #7:

The results from tests measuring childrens' intelligence quotients (IQs) show that out of every one thousand children tested approximately

1 child will have an IQ above 145

22 children will have IQs between 130 and 145

136 children will have IQs between 115 and 130

341 children will have IQs between 100 and 115

341 children will have IQs between 85 and 100

136 children will have IQs between 70 and 85

23 children will have IQs below 70

Based on this information what would be your best estimate of your child's IQ? Please keep in mind that an IQ score is a relative measure. That is, it reflects how well a child performs on the test as compared to other children of his same age. Also keep in mind that the average IQ score is 100. The majority of children score within 15 points plus or minus 100 (between 85 and 115). Scores within this range are considered normal.

This information was provided in order to maximize the chances that the mothers would give accurate and sensible estimates of their children's IQ scores. The mothers were also provided with a definition of a percentile score before they were asked to give the percentile estimates of their children's IQ scores. This definition was provided in question #8 and read as follows:

A percentile indicates where your child's IQ score ranks in comparison to other children who have taken the same IQ test. A percentile score of 50 would mean your child's score is in the middle. Half of the other children who took the test would have scored above him and half would have scored below him. A percentile score of 80 would mean your child did better than 80% of the other children who took the test and worse than 20%. A percentile score of 25 would mean your child

did better than 25% of the other children who took the test and worse than 75%.

Again, the above definition was provided in order to maximize the chances that the mothers would give accurate and sensible percentile estimates of their children's IQ scores.

In this study it was essential to obtain a valid measure of the mothers' perceptions of their children's intellectual abilities since the purpose of the study was to determine how accurate these perceptions were and whether or not they predicted the children's academic achievement. The three types of estimates that the mothers were asked to give were included in the questionnaire for the above reason. Theoretically, all three of these measures should correlate highly with each other since they are basically asking the same thing in three different ways. It was decided beforehand that the numerical estimate would be used to determine the mothers' accuracy scores as long as it correlated highly with the mothers' ratings of their children's abilities, that is, as long as it appeared to be a sensible and valid measure of the mothers' perceptions. The numerical estimate was preferred because the mothers' accuracy scores could be easily computed from it by taking the difference between each mother's numerical estimate and her child's real IQ score. The percentile estimate would be used to compute the accuracy scores only in the event that they appeared to be better measures of the mothers' perceptions than the numerical estimates.

8. Accuracy of the mothers' perceptions of their children's abilities. The accuracy scores of the mothers were computed by taking the difference between the mothers' numerical estimates of their children's IQ scores and their children's real IQ scores. The accuracy scores obtained by using this procedure were negative if the mothers had underestimated their children's IQ scores and positive if they had overestimated their children's IQ scores. Also, the closer these accuracy scores were to zero, the more accurate the mothers had been in estimating their children's IQ scores.

The mothers' numerical estimates of their children's IQ scores were used to compute the accuracy scores because the preliminary analysis of the data suggested that these estimates were relatively sensible measures of the mothers' perceptions. The correlation between the numerical estimates and the mothers' ratings of their children's abilities was fairly high (r = -.75, p = .0001). Table 11 in the Results chapter shows the intercorrelations obtained for the three different type of estimates and the children's real IQ scores. More will be said about these intercorrelations in the Results chapter.

Perhaps it should be mentioned here that although the mothers' numerical estimates appear to be fairly valid measures of their perceptions, the reliability of the accuracy scores derived from these estimates remains in question. As mentioned before, these accuracy scores were obtained by taking the difference between the mothers' numerical

estimates of their children's IQ scores and their children's real IQ scores. Difference scores of this type, and difference scores in general, tend to be less reliable measures than single scores. The unreliability of difference scores is mainly due to the fact that the errors of measurement associated with each measure used to compute the difference score contribute to the overall error variance of the difference score. Usually, if the measures used to obtain the difference score have high initial reliabilities, then the reliability of the difference score will be considerably higher than if the measures had poor initial reliabilities (Mehrens & Lehmann, 1975). In the case of the accuracy measure computed for this study, only the reliability of one of the measures used to derive this score is known (the average standard error of measurement for the WISC-R full scale IQ score is 3.19 points)(Wechsler, 1974); therefore, it will not be possible to estimate the reliability of the accuracy scores. Not knowing the reliability of the mothers' accuracy scores may be a problem in this study since one of the main hypotheses has to do with the relationship between these accuracy scores and the children's academic achievement. It is possible, for example, that no relationship between the accuracy of the mothers' perceptions and their children's level of academic achievement is found simply because the accuracy scores were too unreliable rather than because no relationship actually exists. In order to be able to discern which of these interpretations is more likely if such negative results were found, it would

be helpful if it could be shown that the mothers' accuracy scores correlate with another measure which theoretically should be related to them. The two measures that follow were included in the study for this reason.

9. Frequency of the mothers' opportunities to observe their children's intellectual abilities. This measure was included in the study to determine whether the accuracy of mothers' perceptions varied as a function of how frequently the mothers had the opportunity to observe their children. As mentioned before, this measure was also included hoping it would help clarify the results in the event no relationship was found between the accuracy of mothers' perceptions and their children's academic achievement. Theoretically, the amount of time mothers spend observing their children's intellectual abilities should correlate positively with how accurately they predict their children's IQ scores. That is, mothers who spend more time with their children should be more accurate than mothers who spend less time with them. The measure of the frequency of the mothers' opportunities to observe their children's intellectual abilities was derived from question #9 of the questionnaire. This question read as follows:

> The following is a list of instances in which parents have had the opportunity to observe their child's intellectual performance. Please indicate whether or not you have had the opportunity to observe your child's intellectual abilities under these circumstances. Also indicate how frequently

you have had this opportunity by putting a number from 0 to 5 by the activity to reflect the following frequencies:

0 = never

1 = very infrequently, less than once a month.

2 = not very often, at least once every two weeks.

3 = regularly, at least once a week.

4 = often, at least three times a week.

5 = very frequently, almost every day.

_____ listening to your child name letters of the alphabet or read.

_____ explaining to your child the meaning of a word.

_____ listening to your child count or solve arithmetic problems.

_____ observing your child work on a jigsaw puzzle.

_____ helping your child with his school work or looking over his school work.

_____ teaching your child the words to a song, poem or prayer.

_____ discussing with your child the plot of a television program, movie or book.

_____ playing reasoning-type games with your child or observing him play these games with other children.

_____ playing games that require remembering a set of rules or observing your child play these

sort of games (e.g., table games, card games, sports).

_____ teaching your child how to do a specific task

_____ observing your child put something together or working on a craft.

_____ observing your child talking and interacting with other children.

_____ looking over your child's art work.

_____ playing video games with your child or observing him play these games with other children.

A global score reflecting the total frequency of opportunities mothers have had to observe their children's abilities was computed for each mother. This global score was computed by adding up all the frequency ratings for all 14 situations. The possible range of scores was from 0 to 70. A score of zero would be given to a mother who indicated never having the opportunity to observe her child's intellectual abilities under any of the 14 situations listed. A score of 70 would be given to a mother who indicated having had the opportunity to observe her child's abilities under all 14 situations "very frequently."

10. Frequency of mothers' opportunities to compare their children's intellectual abilities with those of other children. This measure was also included in the study to help clarify possible negative results. Again, it was expected that this measure would correlate positively with the

mothers' accuracy scores. This measure was derived from question #10 of the questionnaire which read as follows:

> The following is a list of instances in which you may have had the opportunity to compare your child's intellectual abilities to the abilities of other children of your child's same age. Please indicate whether or not you have had the opportunity to compare your child's performance with that of other children under the following circumstances. Also indicate how frequently you have had these opportunities by putting a number from 0 to 5 to indicate the following frequencies:
>
> 0 = never
>
> 1 = very infrequently, less than once a month.
>
> 2 = not very often, at least once every two weeks.
>
> 3 = regularly, at least once a week.
>
> 4 = often, at least three times a week.
>
> 5 = very frequently, almost every day.
>
> _____ listening to other children of your child's age name letters of the alphabet or read.
>
> _____ explaining the meaning of a word to other children of your child's age.
>
> _____ listening to other children of your child's age count or solve arithmetic problems.
>
> _____ observing other children of your child's age working on a jigsaw puzzle.

_____ helping other children of your child's age with their school work or looking over their school work.

_____ teaching other children of your child's age the words to a song, poem or prayer.

_____ discussing the plot of a television program, movie or book with other children of your child's age.

_____ playing reasoning-type games with children of your child's age or observing them play these games.

_____ observing children of your child's age playing games that require remembering a set of rules.

_____ teaching other children of your child's age how to do a specific task.

_____ observing other children of your child's age putting something together or working on a craft.

_____ observing other children of your child's age talking and interacting with each other.

_____ looking over the art work of other children of your child's age.

_____ playing with or observing other children of your child's age playing video games.

A global score was also computed for this measure by adding up all the frequency ratings given by the mothers for

all 14 situations listed. As before, the possible range of scores on this measure was from 0 to 70.

11. Mothers' demands for their children's academic achievement. Two measures of the mothers' demands for their children's academic achievement were included in the study. These measures were derived from questions #2 and #3 of the questionnaire. These questions read as follows:

> How low would your child's grades in school have to get before you let him know that your are not satisfied with his school work?
>
> ___ I would be dissatisfied with more B's than A's.
>
> ___ I would be dissatisfied with grades lower than A's and B's.
>
> ___ I would be dissatisfied with more C's than B's.
>
> ___ I would be dissatisfied with grades lower than C's.
>
> ___ I would be dissatisfied with more D's than C's.
>
> ___ I would be dissatisfied with grades lower than D's.
>
> ___ I would never let him know that I am dissatisfied.
>
> How high would your child's grades in school have to get before you let them know that your are very pleased with his school work?

___ I would be very pleased with mostly A's and a few B's.

___ I would be very pleased with mostly B's and a few A's.

___ I would be very pleased with mostly B's and a few C's.

___ I would be very pleased with mostly C's and a few B's.

___ I would be very pleased with mostly C's and a few D's.

___ I would be very pleased with no F's.

___ I would be very pleased with whatever grades he brought.

The responses given by the mothers to the first question represent the minimum level of demands mothers make of their children. The responses given to the second question represent the pleasing level of demands, that is, the minimum level of grades the children have to get in order to please their mothers. Numbers from one to seven were assigned to each of the responses to both of these questions. A score of one on the minimum demands measure was given to a mother who answered that she would be dissatisfied if her child got more B's than A's. A score of seven was given to a mother who answered that she would never let her child know that she was dissatisfied with her child's school performance. Likewise, a score of one on the pleasing level of demands measure was given to a mother who answered that she would be very pleased if her child got mostly A's and B's.

A score of seven was given to a mother who answered that she would be very pleased with whatever grades her child brought home.

In addition to all of the above measures derived from the questionnaire, a few other questions were included in the questionnaire for other purposes. Question #1 was included mainly as a warmup question in order to get the mothers thinking about their children's school performance. This question read as follows:

What are your child's grades in school?

___ he gets mostly A's with very few B's.

___ he gets mostly A's and B's only.

___ he gets mostly B's with some A's and C's.

___ he gets mostly C's with some B's and D's.

___ he gets mostly D's with some C's and F's.

___ he gets mostly F's with some D's and C's.

Numbers from one to six were assigned to each of the responses given to this question. A score of one was given to the mothers who answered that their children were getting the highest grades and a score of six to those who answered they were getting the lowest grades.

A couple of open-ended questions (#4 and #6) were also included in the questionnaire. The answers to these questions were not included in the main data analyses. These questions were included to generate hypotheses for future studies dealing with parents' perceptions of their children's intellectual abilities. These questions read as follows:

#4. Please comment on your child's school work. If he is doing well in school, why do you think he is doing well? If he is not doing well in school, why do you think he is not doing well?

#5. Can you describe any of the things that your child does or has done in the past which have led you to believe that his intellectual abilities are at the level that you have indicated in question #5?

Perhaps it should be mentioned that the majority of the mothers filling out this questionnaire had no problems understanding the questions. When they did have a problem, it usually had to do with questions 9 and 10 of the questionnaire. These were the two measures of the frequency of opportunities mothers have to observe and compare their children's intellectual abilities. Usually the mothers mentioned that when their children were younger they had had the opportunity to observe their abilities more frequently than now that they were older. The mothers usually wanted to know whether their answers should reflect how frequently they observe their child now at his present age, or how frequently they had observed their child in the past. When this question was asked the experimenter told the mothers to answer how frequently they had the opportunity to observe their children now, at the child's present age.

CHAPTER THREE
RESULTS

The results of this study will be presented in three parts. The first part will include the descriptive statistics of each of the variables used. The second part will include a description of how these variables intercorrelate with each other. Finally, the third section will cover the results of the regression analyses performed to answer the major questions of the study.

Descriptive Results

1. Age of the children. The children ranged in age from 6-3 to 12-6 years. The mean age was 9-5 and the standard deviation was 1-10. The age distribution of the children was very similar in all three of the schools sampled. A one-way analysis of variance was conducted with "school" as the independent variable to make sure the age of the children did not differ by school. The results of this analysis indicated that there were no significant differences among the schools in terms of the age of the children.

It should be mentioned that five additional separate analyses of variance were conducted to determine whether the following variables differed by school: the IQ scores of the children, the children's SAT and GPA scores, the mothers' level of education, and the families' SES levels. Since none of these variables were found to differ

significantly among the schools the data for all three schools were pooled for the remaining analyses.

2. Sex of the children. There were 34 males and 36 female children in the study. Table 1 shows the sex distribution of the children by age. As can be seen, there were comparable number of male and female children throughout the different age groups in the sample.

3. Socio-economic status of the children's families. The Hollingshead's index of social position scores computed for the children's families ranged from 11 to 73. The average score was 32.17 and the standard deviation was 15.16. Tables 2 and 3 show the percentage of the children's fathers falling into the different levels of the Hollingshead's educational and occupational scales. As mentioned in the Method chapter, the ratings on these two scales were used to compute each family's index of social position score.

4. Mothers' level of education. The number of years of formal schooling the mothers had achieved ranged from 9 to 20 years. The mean was 13.87 years and the standard deviation was 1.81 years. Table 4 shows the percentage of mothers at several different education levels. As can be seen, the majority of the mothers had educations beyond the high school level (over 68%).

5. Children's intelligence quotients (IQs). The children's full scale IQ scores on the WISC-R ranged from 81 to 139. The mean was 109.08 and the standard deviation was 11.92. Table 5 shows the percentage of children at five different levels of IQ. As can be seen from this table, the

Table 1

Age and Sex Distribution of the Children

	Age			
Sex	6-7	8-9	10-12	Total
Males	11	10	13	34
Females	10	10	16	36
Total	21	20	29	70

Table 2

Percentage of the Children's Fathers at Each Level of the Hollingshead's Educational Scale

		Percentage of the total sample	Number of fathers
1.	Professional (M.A., M.S., M.E., M.D., Ph.D., LL.B.)	20.00	14
2.	Four-year college graduate	18.60	13
3.	1-3 years of college	35.70	25
4.	High school graduate	22.86	16
5.	10-11 years of school	0.00	0
6.	7-9 years of school	2.86	2
7.	Under 7 years of school	0.00	0
	Total	100.00	70

Note. The seven scale positions for the Hollingshead's Educational Scale were listed in Bonjean et al., 1967, p. 383.

Table 3

Percentage of the Children's Fathers at Each Level of the Hollingshead's Occupational Scale

		Percentage of the total sample	Number of fathers
1.	Higher executives of larger concerns, proprietors and major professionals	22.86	16
2.	Business managers, proprietors of medium sized businesses and lesser professionals	18.60	13
3.	Administrative personnel, owners of small businesses and minor professionals	20.00	14
4.	Clerical and sales workers, technicians and owners of little businesses	18.60	13
5.	Skilled manual employees	11.43	8
6.	Machine operators and semi-skilled employees.	7.14	5
7.	Unskilled employees.	1.43	1
	Total	100.00	70

Note. The seven scale positions for the Hollingshead's Occupational Scale were listed in the Bonjean et al., 1967, p. 383.

Table 4

Percentage of Mothers at Five Different Education Levels

	Percentage of the total sample	Number of mothers
1. Professional (17 years of school or more)	5.71	4
2. College graduate (16 years of school)	14.29	10
3. Some college (13-15 years of school)	48.57	34
4. High school graduate (12 years of school)	30.00	21
5. No high school (under 12 years of school)	1.43	1
Total	100.00	70

Table 5

Percentage of the Children at Five Different Levels of IQ

IQ	Classification	Percentage of the total sample	Number of children
130+	Very Superior	5.71	4
120-129	Superior	11.43	8
110-119	High Average	22.86	16
90-109	Average	54.29	38
80-89	Low Average	5.71	4
Total		100.00	70

Note. The IQ classifications were taken from Wechsler, D., 1974, p. 26.

majority of the children had average to above average IQs. At least 80% of the children had IQ scores of 100 or more.

6. Children's academic achievement. The children's scores on the Stanford Achievement Test ranged from the 17th to the 99th percentile. The mean SAT percentile score was 71.23 and the standard deviation was 19.85. Over 84% of the children had SAT scores above the 50th percentile. Thus, the sample as a whole performed well above national averages on the 1983 administration of the SAT. The children's grade point averages also showed above average performance in academic achievement. They ranged from 0.69 to 4.0 with a mean of 2.94 and a standard deviation of 0.69. According to the scale used to compute the children's GPA scores, a GPA of 2.94 would fall between a B- and a B letter grade. At least 90% of the children had GPAs above a 2.0 or a C level and approximately 50% of them had GPAs above a 3.0 or above a B level.

7. Mothers' perceptions of their children's intellectual abilities. The mothers' ratings of their children's intellectual abilities ranged from 1 (exceptional) to 6 (slightly below average). The average rating was 3.49 which would fall between a 3 (above average) and a 4 (slightly above average) rating. The standard deviation was 1.21. Approximately 4% of the mothers rated their children as exceptional; 19% rated them as well above average; 29% rated them as above average; 23% as slightly above average; 24% as average and only one mother (1.43%) rated her child as

slightly below average. These results indicate that when using this rating scale the mothers were very reluctant to rate their children's abilities as anything but average or better. A slightly different picture emerges from the results of the mothers' numerical estimates of their children's IQs. These estimates ranged from 75 to 143. The average IQ estimate given by the mothers was 114.86 and the standard deviation was 14.01. Although the majority of the mothers still answered that their children's abilities or IQ scores were above average (over 91% estimated their children's IQs to be at or above 100), a greater percentage of them gave below average estimates than when using the rating scale. Over 8% gave IQ estimates below 100. The mothers' percentile range estimates of their children's IQ scores ranged from "40-49th" percentile to "over 95th" percentile. The average percentile range estimated by the mothers was 80th-89th and the standard deviation was over 10 percentile points. As with the rating scale, when giving percentile estimates of their children's IQs the mothers were very reluctant to say their children's percentile IQs were below average or below the 50th percentile. Only one mother said her child's percentile IQ would fall below this level.

8. Accuracy of the mothers' perceptions of their children's abilities. As mentioned in the Method chapter, the mothers' accuracy scores were computed by taking the difference between their numerical estimates of their children's IQ scores and their children's real IQ scores. The mothers' accuracy scores indicated that a great number of them were

fairly accurate in predicting their children's IQ scores. Approximately 37% predicted their children's IQs within six points (plus or minus) of their children's real IQs. The majority of the mothers, however, were wrong by more than six points. When the mothers were wrong, they usually erred in the direction of overestimating their children's IQs. Over 47% of the mothers overestimated their children's scores by more than six points. These overestimations ranged from 7 points to 39 points. The average overestimation was 15.88 points and the standard deviation was 7.77. Although the majority of the mothers overestimated their children's IQs, at least 16% of them underestimated their children's IQs by more than six points. The average underestimation was 13.18 points and the standard deviation was 9.80. One mother underestimated her child's IQ score by as much as 41 points! Table 6 shows the percentage of mothers who were accurate within six points and the percentage of those who overestimated and underestimated their children's IQ scores.

Perhaps it should be mentioned that although many of the mothers were fairly accurate in predicting their children's IQ scores, the majority of them expressed a great deal of uncertainty when giving their estimates. Many of them told the experimenter when filling out the questionnaire that they had no idea what their child's IQ was and that their estimate was simply a "wild guess." When asked to give the numerical estimates the mothers were also asked to

Table 6

Percentage of Mothers Who Were Accurate and Who Overestimated and Underestimated their Children's IQ Scores

	Percentage of the total sample	Number of mothers
Overestimated by 15 points or more	18.57	13
Overestimated within 7-14 points	28.57	20
Accurate within 6 points	37.14	26
Underestimated with 7-14 points	12.86	9
Underestimated by 15 points or more	2.86	2
Total	100.00	70

give a range of IQ scores within which they thought their child's IQ would fall. The majority of the mothers gave very wide ranges which probably reflect the uncertainty they felt about their estimates. The size of the ranges given by the mothers ranged from 5 to 45 IQ points. The average range size was 23.67 IQ points and the standard deviation was 11.14.

9. Frequency of the mothers' opportunity to observe their children's intellectual abilities. The global frequency scores computed for each mother ranged from 17 to 62. The average score was 40.24 and the standard deviation was 11.27. An average global score of 40.24 when divided by the 14 different situations listed in question #9 of the questionnaire yields an average frequency score of 2.87 per situation. That is, mothers reported having the opportunity to observe their children with some degree of frequency falling between "not very often" (equivalent to a rating of 2) and "regularly" (equivalent to a rating of 3). Table 7 shows the average frequency rating given by the mothers for each of the 14 situations asked about in question #9. As can be seen from this table, the mothers reported having the opportunity to observe their children "talking and interacting with other children" more often than any other type of situation. They also reported having very few opportunities to observe their children "working on a jigsaw puzzle" or "playing video games."

10. Frequency of the mothers' opportunities to compare their children's intellectual abilities with those of other

Table 7

Average Frequency Ratings Given by the Mothers to Each of the 14 Situations Listed in Question #9

	Mean
1. Listening to your child name letters of the alphabet or read	3.46 (1.55)[a]
2. Explaining to your child the meaning of a word	3.17 (1.35)
3. Listening to your child count or solve arithmetic problems	2.97 (1.31)
4. Observing your child working on a jigsaw puzzle	1.61 (1.20)
5. Helping your child with his school work	3.96 (1.32)
6. Teaching your child the words to a song, poem or prayer	2.24 (1.42)
7. Discussing with your child the plot of a TV program, movie or book	3.19 (1.26)
8. Playing reasoning-type games with your child or observing him play these games	2.43 (1.24)
9. Playing games that require remembering a set of rules	2.71 (1.32)
10. Teaching your child how to do a specific task	2.91 (1.13)
11. Observing your child put something together or working on a craft	2.68 (1.14)
12. Observing your child talking and interacting with other children	4.01 (1.10)
13. Looking over your child's art work	3.17 (1.19)
14. Playing video games with your child or observing him play these games	1.81 (1.63)

Note. A frequency rating of 1 = very infrequently, 2 = not very often, 3 = regularly, 4 = often, 5 = very frequently.

[a]Numbers in parentheses indicate the standard deviations.

children of the same age. Overall, mothers reported having less frequent opportunities to compare their children's intellectual abilities than to observe them. The average global frequency score for this measure was 18.99 with a standard deviation of 14.20 as compared to an average frequency score of 40.24 for the previous measure. An average global score of 18.99 is equivalent to an average frequency score of 1.36 for each of the 14 situations asked about in question #10. That is, mothers reported having the opportunity to compare their children's abilities with some degree of frequency falling between "very infrequently" (equivalent to a rating of 1) and "not very often" (equivalent to a rating of 2). Table 8 shows the average frequency rating given by the mothers for each of the 14 situations asked about in question #10 of the questionnaire.

11. Mothers' demands for their children's academic achievement. The minimum level of demands mothers reported making of their children ranged from "I would be dissatisfied with more Bs than As" (equivalent to a rating of 1) to "I would never let him know that I am dissatisfied" (equivalent to rating of 7). The average minimum level of demands for the sample as a whole was 2.88 and the standard deviation was 1.17. An average demand level of 2.88 would fall somewhere between "I would be dissatisfied with more Cs than Bs" (equivalent to a rating of 3) to "I would be dissatisfied with grades lower than As and Bs" (equivalent to a rating of 2). Table 9 shows the percentage of mothers at

Table 8

Average Frequency Ratings Given by the Mothers to Each of the 14 Situations Listed in Question #10

	Mean
1. Listening to other children of your child's age name letters of the aphabet or read	1.51 (1.43)[a]
2. Explaining the meaning of a word to other children of your child's age	1.52 (1.28)
3. Listening to other children of your child's age count or solve arithmetic problems	1.40 (1.40)
4. Observing other children of your child's age working on a jigsaw puzzle	1.00 (1.20)
5. Helping other children of your child's age with their school work	1.00 (1.42)
6. Teaching other children of your child's age the words to a poem, song or prayer	0.82 (1.07)
7. Discussing the plot of a TV program, movie or book with other children of your child's age	1.27 (1.29)
8. Playing reasoning-type games with other children of your child's age	1.25 (1.31)
9. Observing children of your child's age playing games that require remembering rules	1.71 (1.41)
10. Teaching other children of your child's age how to do a specific task	1.24 (1.26)
11. Observing other children of your child's age putting something together	1.12 (1.19)
12. Observing other children of your child's age talking and interacting with each other	2.75 (1.75)
13. Looking over the art work of other children of your child's age	1.27 (1.11)
14. Playing with or observing other children of your child's age playing video games	1.04 (1.05)

Note. A frequency rating of 1 = very infrequently, 2 = not very often, 3 = regularly, 4 = often, 5 = very frequently.

[a]Numbers in parentheses indicate the standard deviations.

Table 9

Percentage of Mothers at Each Level of Minimum Demands for Academic Achievement

	Percentage of the total sample	Number of mothers
1. Dissatisfied with more Bs than As	12.86	9
2. Dissatisfied with grades lower than As and Bs	27.14	19
3. Dissatisfied with more Cs than Bs	22.86	16
4. Dissatisfied with grades lower than Cs	35.71	25
5. Dissatisfied with more Ds than Cs	0.00	0
6. Dissatisfied with grades lower than Ds	0.00	0
7. Never dissatisfied	1.43	1
Total	100.00	70

each level of minimum demands. It should be noted from this table that almost all the mothers (except for one who answered she would never let her child know that she was dissatisfied) demanded grades of at least Cs or better from their children.

The pleasing level of demands mothers reported making of their children were, on the average, higher than the minimum level of demands. The pleasing level of demands ranged from "I would be pleased with mostly As and a few Bs" to "I would be very pleased with whatever grades he brought home." The average pleasing level of demands was 2.2 and the standard deviation was 1.31. An average demand level of 2.2 would fall between "I would be very pleased with mostly Bs and a few As" to "I would be very pleased with mostly Bs and a few Cs" (equivalent to ratings of 2 and 3, respectively). Table 10 shows the percentage of mothers at each pleasing level of demands. As can be seen, over 71% of the mothers reported they would be pleased with As and Bs only (equivalent to ratings of 1 and 2). Only two mothers answered they would be pleased with whatever grades their child brought.

12. Responses to the warm-up and open-ended questions. As was mentioned in the Method chapter, a warm-up question asking the mothers about their children's grades in school was also included in the questionnaire as well as a couple of open-ended questions. The mothers' responses to the warm-up question indicated that the mothers knew and remembered accurately what kind of grades their children were getting in school. The responses to the warm-up question ranged

Table 10

Percentage of Mothers at Each Level of Pleasing Demands

	Percentage of the total sample	Number of mothers
1. Pleased with mostly As and a few Bs	32.86	23
2. Pleased with mostly Bs and a few As	38.57	27
3. Pleased with mostly Bs and a few Cs	15.71	11
4. Pleased with mostly Cs and a few Bs	7.14	5
5. Pleased with mostly Cs and a few Ds	2.86	2
6. Pleased with no Fs	0.00	0
7. Pleased with anything	2.86	2
Total	100.00	70

from "he gets mostly As with very few Bs" to "he gets mostly Ds with some Cs and Fs." The average response on this question was a rating of 2.53 with a standard deviation of 1.0. A rating of 2.53 in this scale translates to grades mostly above a C letter grade which is exactly what the majority of the children were getting (90% had GPAs above a 2.0 or a C level). The correlation between what the mothers said their children's grades were and the children's actual grades also indicates that the mothers were very aware of their children's performance in school. More will be said about the correlation between these two variables later in this chapter.

The mothers' responses to the first open-ended question were rather interesting. This question asked them why they thought their children were doing well or poorly in school. Approximately half of the mothers (52%) said their children were doing well in school. The remainder said their children were not doing well or not doing as well as they could. The mothers who responded that their children were doing well usually attributed their children's good school performance to some specific personality characteristic of their children. Over 58% of the mothers' responses made mention to personality characteristics such as maturity level, ability to concentrate, self-confidence, possession of good study habits, eagerness to learn and eagerness to please parents and/or teachers. The most common response was eagerness to learn. Interestingly enough, the children's natural

abilities or intelligence was mentioned only by two of the mothers. Over 24% of the responses given by the mothers attributed the children's good school performance to some particular behavior of the mother or the teacher toward the child. The mothers usually mentioned that they gave their children extra attention or described certain discipline rules they had established at home (e.g., the children have to do their homework before they are allowed to play). Other mothers mentioned some characteristics of the teachers or the school environment as the reason that their children were performing well in school. Finally, over 12% of the responses given by the mothers attributed their children's good performance to the amount of "effort" the children were putting into their school work.

It should be mentioned here that some of the mothers gave more than one reason why they felt their children were doing well or poorly in school. The percentages given above reflect the percentages in terms of the total number of different type of responses given rather than the percentage of mothers giving the different type of responses.

The mothers who responded that their children were not doing well in school also attributed their children's poor performance to specific personality characteristics of the children. The personality characteristics more commonly mentioned were the lack of ability to concentrate, immaturity or a lack of a sense of responsibility, poor study skills, introversion and boredom. At least 44% of the mothers' responses made mention to these characteristics as

the main reason why their children were not doing well in school. Approximately 37% of the mothers' responses attributed the children's poor performance to a lack of effort or a lack of motivation to achieve on the part of the children. The remainder of the mothers' responses (16%) blamed the teachers or the schools for their children's poor grades. They usually said the teachers were not spending enough time with the children, not giving them enough positive reinforcement or were putting too much pressure on the children to do well. None of the mothers mentioned their child's lack of natural ability as a possible reason why their child may not be doing well in school. One mother did say that she did not know why her child was doing so poorly in school.

The second open-ended question asked the mothers to describe the things their children do or have done in the past which have led them to believe their children's intellectual abilities are at the level they indicated in the rating scale in question #5 of the questionnaire. The majority of the mothers answered this question by giving positive examples of their children's intellectual abilities. At least 19% of the responses given by the mothers alluded to the children's grades as an indicator of their children's intellectual abilities. It should be pointed out, however, that most of the mothers mentioned grades in combination with some other ability they had observed in their children as an indication of their overall intellectual ability. The specific abilities the mothers said they

had observed in their children included

1. The speed with which their children learned new concepts and ideas (15% of the responses made mention to this specific ability).
2. The children's reading skills and early interest in reading (14% of the responses).
3. The children's inquisitive nature and the sophisticated level of the questions they asked (9% of the responses).
4. The children's memory skills and retention abilities (8% of the responses).
5. The children's imaginations and ability to come up with innovative ideas on their own (6% of the responses).
6. The children's vocabularies and communication skills (5% of the responses).
7. The children's reasoning abilities, logic, and analytic skills (4% of the responses). The remainder of the responses made mention of other more specific characteristics of the children such as a special interest in solving puzzles or certain hobbies, social maturity, a competitive nature, the ability to learn a specific skill on their own, etc. Only four parents described negative characteristics of their children. These parents said their children were slow in learning and/or did not try hard enough to learn.

Intercorrelations among the Variables

Intercorrelations were computed for all 16 variables included in the study. The matrix of Pearson product moment correlation coefficients is included in Appendix D. Out of a total of 120 correlations 57 were found to be significant

at the $p < .05$ $\propto$ level of significance or better. This is not surprising given the nature of some of the variables included in the study. Many of the variables were different measures of the same construct and were expected to correlate highly (e.g., GPAs and SATs were both measures of academic achievement). Other variables were known to be highly related to each other from previous research but were included to be used as control variables in subsequent analyses (e.g., IQ is a well known predictor of SATs and GPAs). Finally, some measures were theoretically expected to correlate with each other (e.g., the mothers' estimates of their children's abilities were expected to correlate with the actual measure of the children's abilities). For the purpose of simplicity, rather than comment on all 57 significant correlations separately, comments will be made on certain clusters of variables which were expected to correlate with each other for any of the above reasons.

The following variables were expected to correlate because they were measures of the same or similar constructs:
1. The children's GPAs and SAT scores. These two measures were expected to correlate because they were both measures of the children's academic achievement. The correlation coefficient for these two variables was $r = .74$, p .0001.
2. The three different type of estimates of the children's intellectual abilities given by the mothers. These were expected to correlate because they were all measures of the mothers' perceptions of their children's abilities. The

intercorrelations among the three types of estimates (rating, numerical IQ, and percentile IQ) are given in Table 11. As can be seen, these correlations were all highly significant. It should be mentioned that the negative signs in these correlations are an artifact of the way the questions in the questionnaire were set up. The rating scale, for example, was set up so that the lowest numerical rating (#1) was equivalent to the highest ability level ("exceptional"). These correlations, although carrying a negative sign, are really positive in nature. That is, each two related variables covary in the same direction (they increase and decrease together). This is also true of many of the correlations listed in Appendix D. For simplicity purposes, the reader should assume that the correlations listed are positive in nature (regardless of their sign) unless otherwise stated in the text.

3. The measure of the frequency of opportunities mothers have to observe their children's abilities and the measure of the frequency of opportunities mothers have to compare their children's abilities to those of other children. Both of these variables can be thought of as measures of how often mothers have a chance to form an impression of the level of their children's intellectual abilities. The correlation between these two variables was expected to be significant. The actual correlation found was $r = .48$, p .0001.

4. The minimum and the pleasing level of demands. Both of these were measures of the mothers' demands for their

Table 11

Intercorrelations among the Mothers' Estimates of their Children's Intellectual Abilities and their Children's Real IQ Scores

	Children's real IQs	Rated intellectual abilities	Numerical IQ estimate	Percentile IQ estimate
Children's real IQs	1.00			
Rated intellectual abilities	-0.52 (.0001)	1.00		
Numerical IQ estimate	0.53 (.0001)	-0.75 (.0001)	1.00	
Percentile IQ estimate	-0.41 (.0005)	0.68 (.0001)	-0.57 (.0001)	1.00

Note. Numbers in parentheses indicate the α level of significance.

children's academic achievement and were expected to be related. The correlation between these two variables was also highly significant (r = .64, p .0001).

Among the variables which were expected to correlate because they are known to be highly related to each other from previous research were the following:

1. The children's IQ scores and the academic achievement measures.
2. The families' SES and the children's academic achievement measures.
3. The families' SES and the children's IQ scores.
4. The families' SES and the mothers' level of education.
5. The mothers' level of education and the children's academic achievement measures.
6. The mothers' level of education and the children's IQ scores.

The intercorrelations among these variables are shown in Table 12. As can be seen, most of the above expected correlations were replicated in this study. The only exceptions were the relationship between the families' SES and the children's academic achievement and the relationship between the mothers' level of education and the children's academic achievement. It is possible that since the sample used in the study was highly selective, the variability in the mothers' levels of education and the families' SES scores may not have been enough to facilitate the finding of significant correlations.

Table 12

Intercorrelations among the Children's IQs, GPAs, SATs, the Mothers' Level of Education and the Families' SES

	IQ	GPA	SAT	SES	Mothers' education
IQ	1.00				
GPA	0.50 (.0001)	1.00			
SAT	0.61 (.0001)	0.74 (.0001)	1.00		
SES	-0.30 (.0119)	0.01 (.9325)	-0.15 (.2240)	1.00	
Mothers' Education	0.25 (.0369)	0.08 (.4979)	0.20 (.0979)	-0.47 (.0001)	1.00

Note. Numbers in parentheses indicate the α level of significance.

The following variables were expected to correlate with each other for theoretical reasons:

1. The mothers' estimates of their children's intellectual abilities and the children's actual IQ scores. As can be seen in Table 11 all three types of estimates given by the mothers were highly related to the children's actual IQ scores. This supports the finding that the mothers had somewhat accurate perceptions of their children's abilities. It should be mentioned here that since the mothers' three types of estimates correlated highly with the children's IQ scores, these estimates also correlated with some of the other measures which are known to correlate with IQ. Examples of these measures are the children's GPAs, SATs, the families' SES and the mothers' level of education. It makes sense that since all these measures correlate highly with the children's IQ scores they should also correlate with the mothers' estimates of these scores. The above reason explained at least 11 of the 57 significant correlations found. The specific correlations for these variables can be found in Appendix D.

2. The mothers' estimates of their children's intellectual abilities and the demands for academic achievement they make of their children. Again, it makes sense that the mothers' levels of demands would correlate with their perceptions of their children's abilities. Table 13 shows the intercorrelations among these variables. As can be seen, all the correlations are significant. The mothers' demands also correlated with the children's actual IQ scores. The correlations

Table 13

Intercorrelations among the Mothers' Demands for Academic Achievement and the Mothers' Estimates of their Children's Abilities

	Minimum demands	Pleasing demands
Rated intellectual abilities	0.31 (.0080)	0.27 (.0214)
Numerical IQ estimates	-0.26 (.0269)	-0.38 (.0014)
Percentile IQ estimates	0.40 (.0007)	0.34 (.0040)

Note. Numbers in parentheses indicate the α level of significance.

between the minimum and the pleasing level of demands and the children's real IQ scores were r = .50, p .0001 and r = .29, p .0153, respectively.

3. The mothers' demands for academic achievement and the children's actual level of academic achievement. These variables were also expected to correlate with each other and they did. The correlations between the children's GPAs and the mothers' minimum and pleasing level of demands were r = -.45, p .0001 and r = -.29, p .0157, respectively. Likewise, the correlations between the children's SATs and the mothers' minimum and pleasing level of demands were r = -.42, p .0003 and r = -.32, p .0075.

4. The mothers' accuracy scores and the measures of the frequency of opportunities they have to observe and compare their children's abilities. The mothers' accuracy scores unfortunately were not found to correlate with either of the frequency measures. This was contrary to what was expected. It is not clear why these variables were not found to be related. An item analysis was performed on each of the frequency measures to determine whether the global frequency scores computed were accurate reflections of how the mothers had answered each of the items of the measures. The item analyses were performed by computing the correlations between the global frequency scores and the frequency ratings given to each of the items of the measures. The item analyses showed that both frequency measures had high internal consistencies. That is, each and every one of the items

in each of the measures correlated significantly with its respective global frequency score. Table 14 shows the correlations obtained for the item analyses of both frequency measures. It is important to point out that although both measures were shown to have high internal consistencies, it is still not clear whether they are valid indicators of the frequency with which the mothers observe and compare their children's abilities.

These frequency measures showed several unexpected correlations with other variables. The measure of the frequency of opportunities mothers have to compare their children's abilities, for example, was found to correlate significantly with the children's IQ scores, the children's GPAs, the mothers' percentile IQ estimates, and the mothers' ratings of their children's abilities. These correlations indicated that mothers whose children had high IQs and high GPAs reported having more frequent opportunities to compare their children's abilities than mothers whose children had low IQs and GPAs. Also,mothers who reported having more frequent opportunities to compare their children's abilities rated their children's abilities higher and gave higher percentile IQ estimates than mothers who reported having less frequent opportunities. These relationships may have emerged for many sensible reasons. For example, the relationship between the frequency of opportunities mothers have to compare their children and their children's IQs may have emerged because the children with the higher IQs may have mothers who are more intelligent and spend more time comparing their

Table 14

Correlations between the Global Scores of the Frequency Measures and Each of their Respective Items

Item number	Frequency measures	
	Frequency of opportunities to observe the children's abilities	Frequency of opportunities to compare the children's abilities
1	0.62	0.82
2	0.64	0.77
3	0.71	0.89
4	0.52	0.67
5	0.75	0.82
6	0.69	0.82
7	0.65	0.86
8	0.66	0.85
9	0.57	0.82
10	0.53	0.83
11	0.49	0.68
12	0.69	0.78
13	0.36	0.38
14	0.70	0.79

Note. All the correlations were significant at $p <$ than .0001.

children to other children. It should be pointed out, however, that many mothers were not as careful when answering this frequency question as they were when answering other questions. Some mothers, for example, indicated that they had very few opportunities to compare their children to other children. They then proceeded to assign frequency ratings of one across all situations asked about in the question without taking care to read each particular situation and adjust their ratings accordingly. Thus, the validity of these frequency scores is questionable and it is not clear whether the relationships found between this measure and the other variables are reliable. The measure of the frequency of opportunities mothers have to observe their children did not show this problem. The mothers did answer this question carefully. This measure was found to be negatively related to the age of the children (r = -.30, p .0124). That is, the mothers reported having more frequent opportunities to observe the younger children than the older children. This relationship, although unexpected, is a sensible one.

It could also be argued that the frequency measures failed to correlate with the accuracy scores because the accuracy scores themselves may not be valid or reliable measures. This, of course, remains a valid possibility. The accuracy scores were found to be significantly related to all three types of estimates of the children's abilities given by the mothers (rated abilities, r = -.33, p .0050; IQ

numerical estimate, r = .61, p .0001; and IQ percentile estimate, r = -.24, p .0426). All three of these relationships were positive in nature. Mothers whose estimates were high tended to overestimate their children's abilities while mothers whose estimates were low tended to underestimate their children's abilities. The accuracy scores were also found to be related to the children's IQ scores (r = -.36, p .0024). This relationship indicated that mothers with high ability children tended to underestimate their children's abilities and mothers with low ability children tended to overestimate them. More will be said about the mothers' accuracy scores and their relationship with the other variables later in this chapter.

5. The children's academic achievement and the warm-up question which asked the mothers what their children's grades in school were. These two measures theoretically should correlate with each other. The correlation found between the mothers' reports of their children's grades and their children's actual grades or GPAs was r = -.79, p .0001. This shows that the mothers were very aware of their children's performance in school. The mothers' reports of their children's grades also correlated with several variables which had already shown to be related to the children's actual grades. The following are examples of these variables: the children's SATs (r = -.73, p .0001), the children's IQ scores (r = -.59, p .0001), the mothers' ratings of their children's abilities (r = .54, p .0001), the mothers' numerical IQ estimates (r = -.38, p .0011), the

mothers' percentile IQ estimates (r = .53, p .0001), the mothers' minimum demands (r = .58, p .0001) and the mothers' pleasing demands (r = .33, p .0060).

Finally, it should be mentioned that a negative relationship was found between the children's age and the children's GPAs (r = -.25, p .0370). It appears that at the younger ages the children's GPAs are higher than at the older ages. This may be a reflection of the grading policies of the teachers who may be more lenient when grading the work of the younger children. Since age will be included as a control variable in all subsequent analyses, this relationship should not be a problem.

Results of the Multiple Regression Analyses

In order to answer the main questions raised in this study it was necessary to conduct several multiple regression analyses. A multiple regression analysis allows for the evaluation of the relationship between several independent variables (Ys) and a dependent variable (X). Since so many of the variables used in this study were interrelated, this type of analysis was necessary in order to be able to determine the relative contribution made by each of the independent variables to the variance observed in the dependent variable. In this section of the chapter the results of the regression analyses will be presented. These results will be organized around each of the main questions raised in the study.

The first question of interest in this study has to do with the accuracy of the mothers' perceptions of their children's intellectual abilities. More specifically, the question asked whether the mothers' accuracy scores varied as a function of the children's age, sex, IQs, the mothers' level of education, and/or the families' SES. It was predicted that the mothers' accuracy scores would vary as a function of the children's age. That is, the mothers were expected to be more accurate in perceiving the abilities of the older chidlren than the younger children. Mothers with higher levels of education were also expected to be more accurate than mothers with lower levels of education. Finally, the mothers of the children in higher SES families were expected to be more accurate than the mothers of the children in lower SES families. A multiple regression analysis was conducted to answer the above questions.

The multiple regression analysis was conducted with the accuracy variable coded in such a manner that positive accuracy scores indicate errors of overestimation, negative scores indicate errors of underestimation and scores of zero indicate perfectly accurate predictions. It should be noted, that the accuracy variable could have been coded such that no distinction is made between the two different types of estimation errors. That is, rather than use the difference scores with their respective signs, the absolute value of the difference scores could have been used such that zero scores would still represent perfectly accurate predictions but anything greater than zero would represent increasingly greater estimation

errors. In the analysis performed in which accuracy is not coded in a truly linear manner, the possible linear relationships between accuracy and any other variables were examined by including a quadratic term in the regression model. This quadratic term was really testing for linear relationships of the type that would emerge if the accuracy scores had been coded in a truly linear manner. The linear term included in the regression model was testing whether the two different types of estimation errors (i.e., overestimations and underestimations) differed in the way they related to the other variables included in the analysis. It should be noted that linear and quadratic terms were included in all the regression analyses which included the accuracy variable.

The results of this analysis indicated that the mothers' accuracy scores did not vary as a function of the children's sex. Contrary to what was predicted, the mothers' scores also did not vary as a function of the children's age or the families' SES scores. A relationship was found, however, between the accuracy scores and the children's IQ scores. It appears that the mothers were less accurate in predicting the IQ scores of children with either very high or very low IQs and were more accurate in predicting the IQs of the children with average scores. The partial correlation between the mothers' accuracy scores and the children's IQ scores after controlling for the effects of all the other independent variables in the analysis was $r = -.39$, p .0013. This relationship was negative in nature.

That is, the mothers of children with low IQs had a tendency to overestimate their children's IQs and the mothers with children with high IQs had a tendency to underestimate their children's scores.

It should be mentioned here that the correlation obtained between the mothers' accuracy scores and the children's IQs may be slightly inflated. This is so because whenever a correlation is computed between a variable x and a difference score which has been derived using that same variable, the error of measurement associated with the variable x will inflate the correlation in the negative direction. It should be noted also that it is possible that this relationship between the mothers' accuracy scores and the children's IQ scores is artifactual in nature. That is, if, for example, there was a tendency for the majority of the mothers to predict their children's IQs to be average or even slightly above average, then mothers with children with very high or very low IQs would appear less accurate since their children's actual IQ scores would be further away from the average predicted scores. The relationship would arise not necessarily because the mothers were less accurate in perceiving the abilities of the children with either very high or very low IQ scores but rather because of a response bias on the part of the mothers who may have preferred to give average or slightly above average IQ predictions. A closer examination of the mothers' predicted IQ scores, however, indicated that the mothers did not exhibit such a response bias. The mothers gave a wide range of IQ predictions and the distribution of their

predicted IQ scores closely parallels that of the actual IQ scores of the children. Approximately 23% of the mothers predicted their children's IQs to be in the 85 to 100 range (24% of the children actually had IQ scores in this range), 30% predicted IQs between 101 and 115 (44% actual IQs fell in this range), 25% predicted IQs between 116 and 129 (25% actual IQs fell in this range). In addition, 19% predicted IQs of 130 or higher (only 6% of the actual IQs were that high) and only one mother predicted her child's IQ score to be under 85 (only one child in the sample had an IQ score that low). A response bias that would result in the type of relationship found between the accuracy scores and the children's IQs is not clearly apparent.

A relationship was also found between the mother's level of education and their degree of accuracy in estimating their children's IQ scores. The partial correlation between these two variables after controlling for the effects of all the other independent variables in the analysis was r = .28, p .0245. This relationship indicated that the higher the education level of the mother the more likely she was to overestimate her child's IQ and the lower the education level the more likely the mother was to underestimate her child's IQ. In other words, contrary to what was predicted, mothers with higher education levels did not estimate their children's IQs more accurately than those with lower education levels. They were, in general, more inaccurate and more likely to overestimate their children's

IQs. Table 15 shows the percentage of mothers at three education levels who were accurate in predicting their children's IQ scores within 6 points and the percentage of those who overestimated and underestimated their children's IQs. As can be seen, a greater percentage of mothers with high school educations were accurate than those with some college or completed college. Also, the higher the education level of the mother, the greater the percentage of overestimations found.

The second major question raised in this study dealt with the possible relationship between the mothers' accuracy scores and the children's academic achievement. It was hypothesized that children whose mothers had accurate perceptions of their abilities would perform better in school than those whose mothers had inaccurate perceptions of them. Both overestimations and underestimations of the children's abilities were expected to predict lower academic performance than accurate perceptions. In order to test the above hypothesized relationship, two parallel regression analyses were conducted. One used the children's SATs and the other used the children's GPAs as dependent variables. The following independent variables were included in both analyses: the mothers' accuracy scores, the children's age, sex, IQs, the families' SES and the mothers' level of education. The last five of these variables were included for control purposes. The linear models used in both analyses included a linear and a quadratic term for the accuracy variable. The results of these analyses showed that there

Table 15

Percentage of Mothers at Three Education Levels Who Overestimated, Underestimated, or Were Accurate in Predicting their Children's IQ Scores

	Mother's level of education		
	High school or less	Some college	Completed college or more
Overestimated child's IQ by 7 points or more	36% (8)	50% (17)	57% (8)
Accurate within 6 points of the child's IQ	50% (11)	32% (11)	29% (4)
Underestimated child's IQ by 7 points or more	14% (3)	18% (6)	14% (2)
Total	100% (22)	100% (34)	100% (14)

Note. The numbers in parentheses indicate the number of mothers in each category.

were no significant quadratic or linear relationships between the mothers' accuracy scores and the children's SATs or GPAs after controlling for the effects of the other five independent variables. The partial correlation for the linear relationship between the mothers' accuracy scores and the children's SAT scores, however, was very close to significance (r = .23, p .0670). This relationship might have been significant if a larger number of subjects had been used. It should be pointed out, however, that even if this relationship had been significant, the nature of the relationship would still be different from what was hypothesized. A positive linear relationship between the mothers' accuracy scores and the children's SATs would indicate that the mothers who overestimated their children's abilities had the children with the highest SAT scores and the mothers who underestimated their children's abilities had the children with the lowest SATs. The most accurate mothers would have the children with the middle SAT scores. This relationship would contradict the hypothesis that the mothers' accuracy was predictive of high academic performance.

It should also be mentioned that of the other independent variables included in the analyses only IQ was shown to be predictive of the children's SATs and GPAs. The partial correlations between IQ and the children's SATs and GPAs after controlling for all the other variables were r = .61, p .0001 and r = .47, p .0001, respectively. The children's IQ scores accounted for 37% of the variance in the children's

SAT scores and 22% of the variance in the children's GPAs. The children's age and sex, the mothers' level of education and the families' SES were not found to be significantly related to the children's academic performance after having controlled for the effects of IQ.

Another question raised in the study was whether the frequency of opportunities mothers have to observe and compare their children's intellectual abilities was predictive of how accurately the mothers perceived their children's abilities. Two parallel regression analyses were conducted to try to answer the above question. Both of the analyses used the mothers' accuracy scores as the dependent variable. In addition, both analyses included the following control variables: the children's age, sex, IQ scores, the mothers' level of education, and the families' SES. Also, one of the analyses used the global frequency scores of the measure of the frequency of opportunities mothers have to observe their children as an independent variable. The other analysis used the global frequency scores of the second frequency measure. The models used in both analyses included a linear and a quadratic term. The results of both analyses showed that neither of the frequency measures was related to the mothers' accuracy scores either linearly or quadratically. These results are consistent with the results of the simple correlations discussed in the previous section of this chapter. The results, however, are contrary to what was predicted. It is not clear why these two

variables were not found to be related. The question of the validity of the frequency measures still remains open.

The fourth question raised in the study dealt with the mothers' demands for their children's academic achievement. More specifically, the question asked whether the mothers' demands varied as a function of their perceptions of their children's abilities and/or as a function of the following variables: the children's age, sex, IQ scores, the mothers' level of education and the families' SES. It was predicted that the mothers' demands would vary as a function of the mothers' perceptions of their children's abilities. That is, mothers who perceive their children as having higher levels of intellectual ability were expected to place higher demands on their children than mothers who perceive their children as having lower levels of intellectual ability. It was also predicted that the mothers' demands would vary as a function of the children's age and IQ scores, the mothers' level of education and the families' SES. In order to answer the above questions two parallel regression analyses were conducted. One analysis used the mothers' minimum level of demands as the dependent variable and the second analysis used the mothers' pleasing level of demands. The following independent variables were included in both analyses: the mothers' numerical estimates of their children's IQ scores, the chidren's age, sex, IQ scores, the mothers' level of education and the families' SES scores. The results showed that the mothers' minimum and pleasing demands did not vary as a function of the children's age or

sex, the mothers' level of education and/or the families' SES levels. The mothers' minimum level of demands, however, were found to be significantly related to the children's IQ scores. After controlling for all other independent variables, the partial correlation between the mothers' minimum demands and the chidlren's IQ scores was r = -.41, p .0007. This relationship indicated that the higher the IQ of the children the higher the minimum level of demands placed by the mothers. The analysis also indicated that the mothers' minimum demands were not significantly related to the mothers' IQ predictions after having controlled for the effects of the children's real IQs and all the other independent variables in the analysis.

The analysis using the mothers' pleasing level of demands as a dependent variable showed the opposite. This analysis showed that the pleasing level of demands did vary as a function of the mothers' IQ predictions but not as a function of the children's actual IQ scores. The partial correlation between the pleasing demands variable and the mothers' numerical estimates of their children's IQs was r = -.25, p .0411 after controlling for the children's age, sex, IQs, the mothers' level of education and the families' SES. The relationship between these two variables was positive in nature as was expected. That is, the higher the IQ scores estimated by the mothers, the higher their pleasing level of demands were. The children's actual IQ scores did not predict the levels of the mothers' pleasing demands, as was

mentioned above. This discrepancy between the way the mothers' estimates of the children's IQs and the children's actual IQs relate to the two different demands measures should not be viewed as a problem. The discrepancy probably is due to the fact that the mothers' estimates and the children's IQs are so highly related to each other that when they are both included as predictor variables in the same regression analysis the analysis shows only one but not the other related to the dependent variable. In this case, the minimum demands was shown to be related to the children's IQs but not the mothers' predictions of the children's IQs. The pleasing demands analysis showed the opposite. The general finding, however, is the same. Apparently, the mothers' demands of their children's academic achievement fluctuate or vary as a function of the children's abilities and/or the mothers' perceptions of those abilities.

The final question raised in this study was whether there was an interaction effect of the mothers' demands and the children's actual IQ scores which would serve to predict the children's level of academic achievement. It was hypothesized that higher demands for academic achievement would only predict higher levels of academic achievement at certain levels of the children's IQ scores. That is, it was expected that the level of academic achievement reached by the children would vary as a function of an interaction between the mothers' level of demands and the children's actual IQ scores. To test this hypothesis four separate regression analyses had to be conducted. Two used the

children's SAT scores as the dependent variable and the other two used the children's GPA scores. Both analyses using the children's SATs as the dependent variable included the following independent variables as controls: the children's age, sex, IQs, the mothers' level of education and the families' SES scores. In addition, one of these analyses included the mothers' minimum level of demands as an independent variable while the second analysis included the mothers' pleasing level of demands. The regression model in both analyses included a linear and a quadratic term for the demands variable as well as an interaction term for the demands variables and the children's IQ scores. The results of the two analyses using the children's SATs as the dependent variable indicated that neither the minimum level of demands nor the pleasing level of demands in interaction with the children's IQ scores predicted their SAT scores. The results also showed that there was no linear or quadratic effect of either the minimum demands or the pleasing demands on the children's SAT scores. In other words, the mothers' level of demands did not predict the children's SATs either by themselves or in interaction with the children's IQ scores. The only variable found to significantly predict the children's SAT scores in both analyses was the children's IQ scores. The partial correlations between the children's IQ scores and their SAT scores after controlling for the effects of all the other independent variables were

r = .50, p .0001 and r = .55, p .0001 for each of the two analyses.

The analyses using the children's GPA scores as dependent variables showed very different results. These analyses included the same control variables as the analyses above. Again, one analysis used the mothers' minimum level of demands as an independent variable while the other used the mothers' pleasing level of demands. The regression models in these analyses also included a linear and a quadratic term for the demands variables and an interaction term for the demands variables and the children's IQ scores. The results showed the following: For the analysis using the minimum demands as an independent variable, a significant linear effect of the demands measure was found (r = -.29, p .0204) after controlling for all the other independent variables in the analysis. In addition, a significant quadratic effect was also found for the minimum demands measure (r = -.27, p .0293) and no significant effect of the interaction of demands and IQ was found. The linear effect indicated that the higher the minimum demands, the higher the children's GPAs were. This relationship apparently was the same at all levels of the children's IQ. The quadratic effect indicated that the children's GPA scores decreased as the minimum demands decreased but only from demands level 1 to demands level 4 (from "I would be dissatisfied with more Bs than As" to "I would be dissatisfied with grades lower than Cs"). After that, the children's GPAs increased again even though the level of minimum demands kept getting lower.

Upon closer examination of the data it was discovered that this quadratic effect was being caused by a single data point at the lowest level of the minimum demands measure. Apparently, all the mothers except for one had given answers at demand levels 4 through 1 and no mothers had given answers at demand levels 5 and 6. The quadratic effect was being caused by one mother who answered at demand level 7 ("I would never let him know that I am dissatisfied"). The decision was made to delete this data point and repeat the analysis to determine whether the quadratic effect would remain or disappear. The analysis was repeated and the results showed a significant linear effect of minimum demands on the children's GPAs (r = -.38, p = .0020) and no significant quadratic effect (r = -.08, p .5340).

The analysis using the mothers' pleasing level of demands showed a similar problem as the one explained above. A borderline quadratic effect was found (r = .24, p .0549) which was being caused by two data points at the lowest level of the demands measure. When these two data points were deleted and the analysis was repeated, the quadratic effect disappeared. It should be mentioned that a significant linear effect of the pleasing demands on the children's GPA scores was found in this analysis (both before and after deleting the two data points in question). The partial correlation between the pleasing demands and the children's GPAs after controlling for the effects of the children's IQs and all the other independent variables in the analysis was

r = -.38, p .0021. This indicates that the higher the pleasing level of demands, the higher the children's GPAs were. It should be mentioned that the children's GPAs were also found to vary as a function of the interaction between the mothers' pleasing level of demands and the children's IQs (when all the data points were included in the analysis). The partial correlation between the children's GPAs and the interaction term in the regression model was r = .25, p .0475. This interaction effect indicated that the linear effect of the mothers' pleasing demands on the children's GPAs was strongest for the children with the lowest IQ scores and disappeared as the children's IQ scores got higher. The children with high IQ scores, it appears, were getting high GPAs regardless of their mothers' level of pleasing demands. The children with lower IQs, however, got higher GPAs the higher the level of their mothers' pleasing demands were. Unfortunately, this interaction effect disappeared and was no longer significant when the analysis was repeated deleting the two extreme data points mentioned above.

Since both the minimum and pleasing level of demands were found to be linearly related to the children's GPAs but no such linear relationship was found between the mothers' demands and the children's SATs, it was decided to repeat the SAT analyses with the two questionable data points deleted. When this was done, significant linear relationships were found between the mothers' demands and the children's SAT scores. The partial correlations between the children's

SATs and the mothers' pleasing and minimum level of demands were r = -.30, p .0159 and r = -.27, p .0287, respectively (after controlling for the children's age, sex, IQ scores, the mothers' level of education and the families' SES and after deleting the two data points in question). This indicates that the mothers' demands predicted both the children's SATs and GPAs. In general, the higher these demands were the higher the children's academic achievement was. The only other significant predictor of the children's academic achievement was the children's IQ scores. Also, it appears that the linear effect of the mothers' demands on the children's academic achievement is the same across all levels of the children's IQ scores.

A question may arise as to whether it was legitimate to delete those two data points in the above analyses. To answer this question it is necessary to examine the demands measures used in the study. More specifically, examine the nature of each of the demands levels of the measures. In both, the minimum and pleasing demands measures, the levels were ordered from the highest demands mothers could make of their children to the lowest demands they could make. The very last level was "I would never let him know that I am dissatisfied" (for the minimum demands measure) and "I would be very pleased with whatever grades he brought" (for the pleasing demands measure). It can be argued that this last level is qualitatively different from the other levels of the measures. Mothers who gave these answers were, in

effect, saying they made no demands of their children. Only two mothers gave these answers and both of them had children who were doing very well in school (both children had GPAs above a B level and SAT percentile scores in the 80s). These mothers may have been saying they made no demands of their children because they may already be pleased with their children's performance in school. It is hard to see how these mothers could be accurately classified as those making the lowest level of demands. A no demands answer may be qualitatively different from a low demands answer. Also, the quadratic relationship observed when the data were analysed with all the data points disappeared completely when the two data points in question were deleted. It can be said, therefore, that a quadratic relationship does not best describe the relationship existing between the mothers' demands and the children's academic achievement (at least not when this relationship is clearly linear for 97% of the data points).

CHAPTER FOUR
DISCUSSION

There were two major goals in this study. The first was to determine whether a specific aspect of mothers' beliefs about their children's abilities, namely, the accuracy of their perceptions, predicted their children's academic achievement. The second goal was to examine the demands mothers make for their children's academic achievement and to determine whether this specific type of parental behavior varied as a function of the mothers' beliefs about their children's abilities. This study also tried to determine whether the mothers' demands could predict the children's actual academic achievement. In general, the results of this study found the mothers to be relatively accurate in their perceptions of their children's abilities but the accuracy of their perceptions was not found to be predictive of their children's academic achievement. The results also showed that the mothers' demands for their children's academic achievement varied as a function of their beliefs about their children's abilities and also served to predict their children's actual levels of academic achievement.

There were also several interesting results of the study with regards to some of the variables that relate to the accuracy of mothers' perceptions of their children's abilities. These results will be discussed first and then

the results of the more interesting relationships between the mothers' perceptions of their children, their behavior towards their children and their children's academic achievement will be discussed.

As was mentioned before, in general, the mothers in this study were found to be relatively accurate in perceiving their children's level of intellectual abilities. Although the majority of the mothers tended to overestimate their children's abilities these overestimations were within reasonable limits. Only 20% of the sample overestimated or underestimated their children's abilities by more than one standard deviation of their children's actual IQ scores. This finding is congruent with Entwisle and Hayduk's (1978) results which showed that mothers' predictions of their children's first grades in school correlated with their children's actual IQ scores. This suggests that even as early as first grade mothers have a reasonable perception or impression of their children's abilities.

The children's ages were not found to be related to the mothers' accuracy in perceiving their children's abilities. It had been predicted that the children's ages would relate to accuracy since supposedly the mothers of the older children had had more feedback about their children's intellectual performance from the schools. These mothers also have had more time to form and adjust their perceptions than the mothers of younger children. Entwisle and Hayduk (1978) found that mothers tended to adjust their expectations of their children's grades in response to the schools' feedback

about their children's actual school performance. It is important to point out, however, that Entwisle and Hayduk's sample consisted of very young children who were just beginning school. The feedback the mothers received from the schools was probably the first formal feedback they had ever received about their children's intellectual performance. According to Entwisle and Hayduk, as the children progressed through second grade the mothers' initial expectations were adjusted and the children's grades also changed such that the discrepancies between the mother's expectations and the children's actual grades were considerably reduced. It is possible that further feedback from the schools at higher grades does not predict further adjustments in expectations since these expectations become fairly congruent with the children's actual performance at a fairly early age. In other words, the accuracy of mothers' predictions and perceptions may be established when children are very young and no further increases in the degree of accuracy may occur with the children's increasing age.

Another variable which was not found to predict the accuracy of mothers' perceptions of their children's abilities even though it had been predicted that it would was the families' SES levels. It is possible that the selective nature of the sample may have restricted the variability of the families' SES scores and reduced the chances of finding a significant relationship between these two variables. The alternative interpretation would be that the families' SES

was truly non-predictive of the mothers' accuracy of perception of their children's abilities. It should be pointed out, however, that the families' SES was also not found to be predictive of the children's academic achievement in this study even though SES is a well known predictor of school performance. This suggests that the constricted range of SES scores may have at least partially contributed to the lack of a significant finding between the variables.

The mothers' level of education, on the other hand, was found to be predictive of the mothers' accuracy scores. The relationship found between these variables, however, was opposite to what was predicted. It was predicted that mothers with higher levels of education would be more accurate than those with lower levels of education. Instead, the finding was that mothers with higher levels of education were more inaccurate. More specifically, these mothers were more likely to overestimate their children's abilities than mothers with lower education levels. It is possible that the reason that these mothers tended to overestimate their children's abilities was that their own educational aspirations and the overall value they attach to educational attainments may have influenced or colored their perceptions of their children's intellectual abilities. Seginer (1983) has suggested that parents' own educational aspirations may be an important antecedent variable influencing the formation of their expectations of their children's achievements. The above results would certainly support Seginer's suggestion.

The children's actual IQ scores were also found to be related to the mothers' accuracy of perception of their abilities. The mothers of the children with the higher IQs were found to have a tendency to underestimate their children's abilities and the mothers of the children with the lowest IQs were found to overestimate their children's abilities. The most accurate mothers were those whose children had average or slightly above average IQs. The possibility of a response bias explaining these results was briefly discussed in the previous chapter. It was pointed out that there was no obvious response bias in effect since the distribution of the IQs predicted by the mothers closely paralleled the distribution of the children's actual IQs. It should be pointed out, however, that even though the two distributions were similar the majority of the mothers still predicted their children's IQs to be in the average range (54% predicted IQs between 85 and 115). It is impossible to determine whether so many of the mothers predicted IQs at the average level because they truly believed that their children's IQs fell in this range or whether they did so simply because they preferred to give average IQ predictions. Either interpretation is just as likely. Entwisle and Hayduk (1978) also reported that their sample of parents were better predictors of moderate-ability children than of high-ability children. They also report a tendency among their sample of parents (white parents only) to make conservative grade predictions, that is a tendency for these parents to "play it safe" and predict mainly B grades. The

same interpretation problem, however, would apply for the Entwisle and Hayduk study as for the present study.

It was also expected in this study that the two frequency measures, that is, the measures of the frequency of opportunities mothers have to observe and compare their children, would be predictive of the mothers' accuracy scores. It was hypothesized that the mothers who reported having more chances to observe and compare their children would be more accurate than those who reported having less frequent opportunities to do so. The results of this study did not support this prediction. The possibility that the frequency and/or the accuracy scores may not have been valid or reliable enough measures to facilitate the finding of a significant relationship between these two variables was discussed in the previous chapter. It should be pointed out, however, that both the accuracy scores and at least one of the frequency measures showed sensible relationships with other variables of the study suggesting that the measures may not have been all that unreliable. Assuming that the lack of a relationship between the two variables was not totally due to a measurement problem, it could be argued that the two variables were found unrelated for the same reasons that age was found unrelated to the mothers' accuracy scores. That is, it is possible that the degree of accuracy of the mothers' perceptions of their children may be established when the children are very young. Further chances to observe and compare their children after that

young age may only serve to confirm the already fairly "accurate" perceptions mothers have of their children. The frequency of opportunities mothers have to observe and compare their children's abilities may play a more important role in the accuracy of mothers' perceptions when the children are at a younger age than the children sampled in this study. Future research is needed to determine how early mothers form impressions of their children's intellectual abilities and what variables influence the accuracy of those perceptions at the early stages of their formation.

One of the main goals of this study was to determine whether the accuracy of mothers' perceptions of their children's abilities could predict the children's academic achievement after having statistically controlled for certain important variables such as the children's IQs, the families' SES, the mothers' level of education, and the children's age and sex. Previous studies examining the effects of expectations on academic achievement have failed to include these important controls. These studies have also usually examined the absolute level of expectations and not the accuracy of the beliefs with regards to the children's actual level of abilities. It was hypothesized in this study that children whose mothers had accurate perceptions of them would perform better in school than those whose mothers had inaccurate perceptions of them. This hypothesis was based on Hunt and Paraskevopoulos' (1980) suggestion that the accuracy of parents' perceptions of their children's abilities might play an important role in

their children's actual intellectual development and performance: It was also based on Entwisle and Hayduk's (1978) finding that unrealistically high expectations fail to have any effects on children's grades. Unfortunately, the results of this study did not show a significant relationship between the mothers' accuracy scores and the children's academic achievement measures. As mentioned in the Results chapter, however, a borderline relationship was found between the mothers' accuracy scores and the children's SATs but the relationship was in a different direction of what was predicted. This borderline relationship suggested that the children who performed better in school were not those with the most accurate mothers but those with mothers who overestimated their abilities. Also, the children with mothers who underestimated their abilities showed the worst school performance. Keeping in mind that the relationship fell short of significance, it appears that Hunt and Paraskevopoulos' (1980) claims would not have been supported by the findings of this study. It should be pointed out, however, that the sample of mothers as a whole was relatively accurate in this study. Perhaps Hunt and Paraskevopoulos' claims would have been supported if the sample had shown greater variability in accuracy scores, that is, if greater percentages of the mothers had been inaccurate beyond one standard deviation of their children's actual IQ scores.

A borderline relationship of the type found in this study could have also emerged because there may have been a tendency among mothers to base their IQ predictions on their children's academic achievement or SAT scores. That is, the mothers who overestimated their children's IQs may have done so because their children's SATs were high to begin with and this may have led them to believe that their children's abilities were also high. Likewise, the mothers who underestimated their children's abilities may have done so because their children's SATs were low. Unfortunately, since the study is correlational in nature it is impossible to determine the direction of causality between the variables involved in this borderline association. There is also the possibility that both variables may have been influencing each other in both directions. Further research is needed to explore the possible relationship between the accuracy of parents' perceptions of their children's abilities and their children's academic achievement. Studies using the samples of mothers from more varied SES levels and perhaps mothers of different races would be especially helpful since these samples are likely to show greater variability in accuracy scores. The most helpful kind of study, however, would be an experimental study in which it could be shown that manipulating the accuracy of parents' perceptions influenced children's academic achievements. This could be done by providing corrective feedback for parents who are initially found to be very inaccurate about their children's abilities and then assessing the effects that this feedback

has on the children's future academic performance. Previous studies of expectancy effects have shown that manipulating expectations often fails to show the desired effects on children's achievement behavior. These studies, however, have always attempted to increase expectations of parents or teachers without regard for the children's actual level of ability. The manipulation techniques have also often been weak (e.g., giving teachers a list of names of potential "spurters"). The type of manipulation suggested above would be more involved and appropriate controls would be included to make sure that the parents' inaccuracies in their perceptions of their children's abilities had been "corrected" by the manipulation technique.

With regards to the mothers' demands for their children's academic achievement it had been predicted that the mothers' demands would vary as a function of their perceptions of their children's abilities. It was also predicted that the mothers' demands would vary as a function of the children's ages, IQs, the mothers' education levels and the families' SES. Only some of these predictions were supported by the findings of this study. The variables which were found to predict the mothers' demands were the mothers' perceptions of their children's abilities and/or the children's actual IQ scores. In general, the mothers appear to be demanding higher levels of academic achievement from the children who have higher IQs and/or those whom they perceive as having higher IQs and they are demanding lower levels of

academic performance from the children with lower IQs and/or those whom they perceive as having lower IQs. This suggests that the mothers' beliefs about their children's abilities may be playing an important role in regulating at least one specific type of parental behavior, that is, the demands mothers make of their children's abilities. It is also possible that the above relationship may have occurred because the mothers' demands are based on the children's previous records of academic achievement which may have also contributed to the formation of their beliefs. Again, since the study was correlational in nature, it is impossible to determine which of the two interpretations is the correct one. Most likely the relationship has emerged because of both. Parents probably do, to a certain extent, base their demands on their beliefs about their children's abilities but they also probably base their demands on what they know about their children's past school performance.

It was also found in this study that the mothers' demands served to predict the actual level of the children's academic achievement. Contrary to what was predicted, however, it was not the levels of the mothers' demands in interaction with the children's IQs which served to predict the children's academic achievement but, rather, the absolute level of the demands. Apparently, the higher the mothers' demands, the higher the children's academic achievement scores were (after having controlled for all the appropriate variables including the children's IQs). Again, this association may have been a function of the mothers

basing their demands on their children's previous records of academic achievement and not necessarily of the demands influencing their children's achievements. It could also have been a function of both. Further research is needed in this area to determine what other parental practices or behaviors vary as a function of their beliefs about their children. Also further research is needed to determine how children's academic achievement is affected when parents' demands are inappropriately high or low given their children's level of ability. In this study, although it was found that the absolute level of demands was more important in predicting the children's academic achievement than the appropriateness of the demands, this may have been so because the demands made by most of the mothers were relatively appropriate to begin with. Most mothers demanded average grades of C or better from their children and most children had average to above average IQs.

The fact that this study was correlational in nature certainly limits the type of conclusions that can be reached with regards to the major findings. More specifically, no causal interpretations can be made with regards to the variables found to be related. It should be noted, however, that this study can be viewed as a general test of the expectancy model presented in Figure 1 which illustrates the hypothesized cycle of influences between expectations and behavior. In this model, it was hypothesized that parents' beliefs and expectations influenced their own behaviors

towards their children which in turn influenced their children's behavior (academic achievement). This study has shown that parents' beliefs about their children's abilities are related to one aspect of their behavior, namely, the demands they make for their children's academic achievement. It has also shown that these demands predict the children's actual school performance. Although these relationships do not confirm the causal links hypothesized in the expectancy model they certainly support it in that the model has "...survived a chance of disconfirmation" (Campbell & Stanley, 1963, p. 64). Previous studies of expectancy effects have usually examined only one causal link of the model at a time. Some studies have examined the effects of adults' expectations on their own behaviors towards children and other studies have examined the effects of these expectations on the children's achievement behaviors. This study is unique in that it has examined all the causal links in the model at the same time. It has also included appropriate controls of variables which previous studies have left uncontrolled. In addition, this study has examined one aspect of parents' beliefs or expectations that previous studies have tended to ignore, namely, the accuracy of parents' beliefs.

Perhaps the most important next step in this area of research is to conduct experimental studies of the type suggested earlier in this chapter. This would allow for causal interpretations of the type needed to confirm the expectancy model. Future studies examining the antecedent

variables that may influence parents' accuracy of perception of their children's abilities are also needed. Studies using younger children would be especially helpful since the results of this study seem to suggest that the accuracy of mothers' perceptions of their children's abilities may be established when the children are very young. These studies should shed further light on the dynamics of parents' belief systems and their effects on behavior.

APPENDIX A
RECRUITMENT LETTER

APPENDIX A
RECRUITMENT LETTER

Dear Parent:

My name is Maria Delgado-Hachey and I am a doctoral student at the University of Florida in Gainesville. Dr. Scott Miller from the department of Psychology, and I are conducting a research study on mothers' perceptions of their children's intellectual abilities. We are interested in finding out what mothers think of their children's intellectual abilities and whether or not this relates to their children's grades in school.

This letter is to earnestly request your participation in this study. If you volunteer to participate, I will set up an appointment to meet with you at your own home for approximately 45 minutes. At this meeting I will ask you to answer a series of questions about your child's intellectual abilities and his/her school work. If your work schedule does not permit you to meet with me during the day, I will be glad to arrange a meeting after 6:00 p.m. I can also meet with you at a place other than your own home if that is your preference.

If you agree to participate I will also need to obtain your permission to test your son/daughter at San Jose Catholic Grade School and to have access to your child's school records. The test your child will be administered is the Wechsler Intelligence Scale for Children. This test will be given individually to your child by me. The results of this test will be kept confidential and will be used solely for the purpose of the research study. Your child's teacher and San Jose School will <u>not</u> have access to this information.

A general summary of the results of the study will be available to you, upon request, after the study is completed. However, the specific results of your child's test will not be available to you.

If you think you are interested in participating please fill out the information sheet attached to this letter and return it to the school with your child. If you would like more information about this study please call me at 724-8197 after 5:00 p.m. Thank you for your cooperation.

Sincerely,

APPENDIX B
MOTHER'S QUESTIONNAIRE

APPENDIX B
MOTHER'S QUESTIONNAIRE

Children differ with respect to how well they do in school and they also differ with respect to their intellectual abilities. Please answer the following questions about your child: (check only one answer for each question).

1. What are your child's grades in school?

___ he gets mostly A's with very few B's.
___ he gets mostly A's and B's only.
___ he gets mostly B's with some A's and C's.
___ he gets mostly C's with some B's and D's.
___ he gets mostly D's with some C's and F's.
___ he gets mostly F's with some D's and C's.

2. How low would your child's grades in school have to get before you let him know that you are not satisfied with his school work?

___ I would be dissatisfied with more B's than A's.
___ I would be dissatisfied with grades lower than A's and B's.
___ I would be dissatisfied with more C's than B's.
___ I would be dissatisfied with grades lower than C's.
___ I would be dissatisfied with more D's than C's.
___ I would be dissatisfied with grades lower than D's.
___ I would never let him know that I am dissatisfied.

3. How high would your child's grades in school have to get before you let him know that you are very pleased with his school work?

___ I would be very pleased with mostly A's and a few B's.
___ I would be very pleased with mostly B's and a few A's.
___ I would be very pleased with mostly B's and a few C's.
___ I would be very pleased with mostly C's and a few B's.
___ I would be very pleased with mostly C's and a few D's.
___ I would be very pleased with no F's.
___ I would be very pleased with whatever grades he brought.

4. Please comment on your child's school work. If he is doing well in school, why do you think he is doing well? If he is not doing well in school, why do you think he is not doing well?

5. Would you say your child's intellectual abilities are:
   ___ exceptional--he is an extremely bright child, gifted for his age.
   ___ well above average--he is a very bright child, brighter than most children his age.
   ___ above average--he is brighter than the average child of his age.
   ___ slightly above average--he is slightly brighter than the average child his age.
   ___ average--he is as capable as the average child of his age.
   ___ slightly below average--he is slightly less capable than the average child of his age.
   ___ below average--he is less capable than the average child his age.
   ___ well below average--he has difficulty keeping up with most children of his age.
   ___ extremely below average--he is not capable of keeping up with children of his age.

6. Please comment on your answer to question #5. Can you describe any of the things that your child does or has done in the past which have led you to believe that his intellectual abilities are at the level that you have indicated?

7. The results from tests measuring children's intelligence quotients (IQ's) show that out of every one thousand children tested approximately
1 child will have an IQ above 145
22 children will have IQ's between 130 and 145
136 children will have IQ's between 115 and 130
341 children will have IQ's between 100 and 115
341 will have IQ's between 85 and 100
136 children will have IQ's between 70 and 85
23 children will have IQ's below 70

Based on this information what would be your best estimate of your child's IQ? Please keep in mind that an IQ score is a relative measure. That is, it reflects how well a child performs on the test as compared to other children of his same age. Also keep in mind that the average IQ score is 100. The majority of children score within 15 points plus or minus 100 (between 85 and 115). Scores within this range are considered normal.

I think my child's IQ is _____.
I do not think my child's IQ is any lower than _____.
I do not think my child's IQ is any higher than _____.

8. Please give a percentile estimate of your child's IQ score. A percentile indicates where your child's IQ score ranks in comparison to other children who have taken the same IQ test. A percentile score of 50 would mean your child's score is in the middle. Half of the other children who took the test would have scored above him and half would have scored below him. A percentile score of 80 would mean your child did better than 80% of the other children who took the test and worse than 20%. A percentile score of 25 would mean your child did better than 25% of the other children who took the test and worse than 75%.

I think my child's IQ score would fall in the following percentile range?

95th. percentile or higher.
between 90th. and 94th. percentile.
between 80th. and 89th. percentile.
between 70th. and 79th. percentile.
between 60th. and 69th. percentile.
between 50th. and 59th. percentile.
between 40th. and 49th. percentile.
between 30th. and 39th. percentile.
between 20th. and 29th. percentile.
between 10th. and 19th. percentile.
between 6th. and 9th. percentile.
5th. percentile or under.

9. The following is a list of instances in which parents may have had an opportunity to observe their child's intellectual performance. Please indicate whether or not you have had the opportunity to observe your child's intellectual abilities under these circumstances. Also indicate how frequently you have had this opportunity by putting a number from 0 to 5 by the activity to reflect the following frequencies:

0 = never.
1 = very infrequently, less than once a month.
2 = not very often, at least once every two weeks.
3 = regularly, at least once a week.
4 = often, at least three times a week.
5 = very frequently, almost every day.

___ listening to your child name letters of the alphabet or read.
___ explaining to your child the meaning of a word.
___ listening to your child count or solve arithemetic problems.
___ observing your child work on a jigsaw puzzle.
___ helping your child with his work or looking over his school work.
___ teaching your child the words to a song, poem or prayer.
___ discussing with your child the plot of a television program, movie, or book.
___ playing reasoning-type games with your child or observing him play these games with other children.
___ playing games that require remembering a set of rules or observing your child play these sort of games (Eg. table games, card games, sports).
___ teaching your child how to do a specific task.
___ observing your child put something together or working on a craft.
___ observing your child talking and interacting with other children.
___ looking over your child's art work.
___ playing video games with your child or observing him play these games.

10. The following is a list of instances in which you may have had the opportunity to compare your child's intellectual abilities to the abilities of other children of your child's same age. Please indicate whether or not you have had the opportunity to compare your child's performance with that of other children under the following circumstances. Also indicate how frequently you have had these opportunities by putting a number from 0 to 5 to indicate the following frequencies:

0 = never.
1 = very infrequently, less than once a month.
2 = not very often, at least once every two weeks.
3 = regularly, at least once a week.
4 = often, at least three times a week.
5 = very frequently, almost every day.

___ listening to other children of your child's age name letters of the alphabet or read.
___ explaining the meaning of a word to other children of your child's age.
___ listening to other children of your child's age count or solve arithmetic problems.
___ observing other children of your child's age working on a jigsaw puzzle.
___ helping other children of your child's age with their school work or looking over their school work.
___ teaching other children of your child's age the words to a song, poem or prayer.
___ discussing the plot of a television program, movie or book with other children of your child's age.
___ playing reasoning-type games with children of your child's age or observing them play these games.
___ observing children of your child's age playing games that require remembering a set of rules.
___ teaching other children of your child's age how to do a specific task.
___ observing other children of your child's age putting something together or working on a craft.
___ observing other children of your child's age talking and interacting with each other.
___ looking over the art work of other children of your child's age.
___ playing with or observing other children of your child's age playing video games.

DATA SHEET

Mother's name: _____

Child's name: _____

Child's age: _____ child's birthdate: _____

Child's sex: _____ child's birth order: _____

Mother's education (number of years of formal schooling):___

Father's education (number of years of formal schooling):___

Mother's occupation: _____

Father's occupation: _____

APPENDIX C
HUMAN SUBJECTS CONSENT FORM

APPENDIX C
HUMAN SUBJECTS CONSENT FORM

CONSENT FORM: Project Title: Mothers' perceptions of their children's intellectual abilities and their relationship to academic achievement.
Principal Investigator: Maria Delgado-Hachey

The purpose of this study is to find out how mothers perceive their children's intellectual abilities and to determine whether or not their perceptions are related to their children's school work. Your participation will consist of a 45-minute session in which you will be asked to answer a series of questions about your child's intellectual abilities and his/her school work. The questions are not intended to measure your intelligence, personality traits, or habits. They are simply intended to show how you and mothers in general view their children's intellectual abilities.

In addition, your child will be administered the Wechsler Intelligence Scale for Children at his/her school. This test will be given individually by the principal investigator of this research study. The test will last approximately 45 minutes and will consist of several verbal questions in different areas (Eg. vocabulary, arithmetic and general information). The test will also include some puzzles and memory tasks.

If you agree to participate, the principal investigator will also need your permission to have access to your child's school records in order to obtain his/her school grades.

Your answers to the questionnaire and the results of your child's test will all be kept confidential and will be used solely for the purpose of this research study. Your child's teacher and school will not have access to this information. A general summary of the results of the study will be available to you, upon request, after the study is completed. However, the specific results of your child's test will not be available to you.

There will be no monetary compensation for participating in this research project. If you have any questions about the procedures of the study please feel free to ask them. You are also free to withdraw your consent and to discontinue participation in the project at any time without prejudice.

I have read and I understand the procedure described above. I agree to participate in the procedure and I have received a copy of this description. I also agree to have my child tested and to give the principal investigator permission to have access to my child's school records.

subject's signature: _____ date: _____

subject's address: _____

I have defined and fully explained this research to the participant whose signature appears above.

Principal Investigator's signature: _____ date: _____

Investigator's address: _____

APPENDIX D
INTERCORRELATIONS AMONG ALL VARIABLES

APPENDIX D
INTERCORRELATIONS AMONG ALL VARIABLES

The Pearson product correlation coefficients computed for the intercorrelations of the 16 variables of the study will be listed in matrix form on the following page. The following abbreviations will be used for the name of the variables:

1. Age — Age of the children.
2. Sex — Sex of the children.
3. SES — SES of the families.
4. Edu — Mother's level of education.
5. IQ — Children's actual IQ scores.
6. GPA — Children's GPA scores.
7. SAT — Children's SAT scores.
8. RCA — Mothers' rating of their children's abilities.
9. #IQ — Mothers' numerical IQ estimates.
10. %IQ — Mothers' percentile IQ estimates.
11. Acc — Mothers' accuracy scores.
12. Fr1 — Frequency of opportunities to observe the children.
13. Fr2 — Frequency of opportunities to compare the children.
14. Min — Mothers' minimum level of demands.
15. Ple — Mothers' pleasing level of demands.
16. Gra — Mothers' reports on the children's grades.

Table 16

Intercorrelations among All Variables

	Age	Sex	SES	Edu	IQ	GPA	SAT	RCA	#IQ	%IQ	Acc	Fr1	Fr2	Min	Ple
Age															
Sex	.03														
SES	-.04	-.05													
Edu	-.01	-.01	-.47**												
IQ	-.22	-.01	-.30*	.25*											
GPA	-.25*	.10	.01	.08	.50**										
SAT	-.13	.11	-.15	.20	.61**	.74**									
RCA	.07	.15	.24*	-.43**	-.52**	-.34**	-.55**								
#IQ	-.03	-.06	-.26*	-.37**	-.53**	.25*	.47**	-.75**							
%IQ	-.06	-.04	.17	-.27*	-.41**	-.35**	-.62**	.68**	-.57**						
Acc	.18	-.05	-.16	.18	-.36**	-.19	-.05	-.33**	.61**	-.24*					
Fr1	-.30*	-.03	-.01	.17	.04	-.01	-.08	-.01	.14	.03	.11				
Fr2	-.06	.04	.00	.15	.26*	.31*	.20	-.32**	.18	-.26*	-.05	.48**			
Min	.09	-.05	.21	-.26*	-.50**	-.45**	-.42**	.31**	-.26*	.40**	.18	.02	-.14		
Ple	-.02	.02	.10	-.15	-.29*	-.29*	-.32**	.27*	-.38**	.34**	.14	.16	-.02	.64**	
Gra	.23	-.20	.16	-.23	-.59**	-.79**	-.73**	.54**	-.38**	.53**	.13	-.04	-.27*	.58**	.33**

* p is less than .05.
** p is less than .01.

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BIOGRAPHICAL SKETCH

Maria Delgado-Hachey was born in Lima, Peru in 1956. She attended schools in Lima until the age of 16, when she moved to the United States. Ms. Delgado-Hachey completed her senior year of high school in Miami, Florida, in 1973. She attended Miami-Dade Community College and in 1975 graduated from that school with an Associate in Arts degree. In September of that same year, she enrolled at Florida International University and in 1977 graduated with a Bachelor of Arts degree in psychology. She enrolled at the University of Florida to pursue advanced studies in the field of developmental psychology in the fall of 1977. At this school she received a Master of Science degree in 1980 and a Certificate in Gerontological Studies in 1981. Maria Delgado-Hachey was awarded a graduate minority fellowship at the University of Florida for three consecutive years from 1977 to 1980. She has also taught a Developmental Psychology course at this university in the spring and fall of 1981. Maria Delgado-Hachey is presently working as a research assistant for Dr. Fonda Eyler, Field Director of the Infant Development Program at Shands Teaching Hospital.

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

Scott A. Miller, Chairman
Associate Professor of Psychology

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

Walter R. Cunningham
Associate Professor of Psychology

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

Patricia H. Miller
Associate Professor of Psychology

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

Richard A. Griggs
Associate Professor of Psychology

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

Patricia T. Ashton
Associate Professor of Foundations
of Education

This dissertation was submitted to the Graduate Faculty of the Department of Psychology in the College of Liberal Arts and Sciences and to the Graduate School, and was accepted as partial fulfillment of the requirements for the degree of Doctor of Philosophy.

April, 1984

Dean for Graduate Studies
and Research